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Drug and Cosmetic Industry

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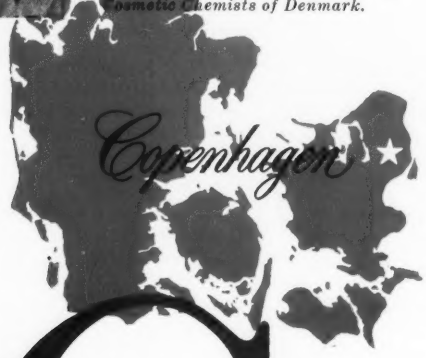
advertisement

SPEAKING FROM DENMARK

ERIK THOMSEN *is a native of Denmark. Since graduation in 1947 he has been employed with Danish soap and cosmetic firms. He is now manager of development and production with Breinings Laboratorium (Madsen and Wessel A/S), one of the oldest Danish cosmetic firms. He is present secretary of the Society of Cosmetic Chemists of Denmark.*

SPEAKING FROM SWITZERLAND

DR. R. HEILINGOTTER *is a graduate of the University of Gottingen, Vienna. He has specialized in hair-waving and hair-dyeing cosmetics since 1932. In recent years he has been chief chemist in a Netherlands plant and now practices as a scientist on hair-cosmetic researches at St. Blaise/Neuchatel, Switzerland.*



REVIEW OF Glycerine IN HAIR PREPARATIONS

SHAMPOOS, RINSES, LOTIONS AND TONICS, RECONDITIONERS, FIXATIVES AND LACQUERS, DRESSINGS

by Erik Thomsen

SHAMPOOS. It is always desirable that shampooing be accomplished in such a way that the resulting hair is not left in a condition of fluffiness, caused by lack of adherence or static electricity. As the demand of the buying public is still for a good foaming shampoo, it has—as far as I have seen—not yet been possible to create a shampoo to be sold completely without that downy fly-away hair drawback. In any event, glycerine is considered by some to be a helpful aid. Powers mentions, "Glycerol helps retain moisture and delay evaporation. Addition in shampoo formulations keeps the hair softer and helps moisture retention." For other reasons, I find glycerine of great value as a shampoo ingredient. It can act as an aid in manufacture, as a clarifier or a bodying agent. I have to admit, that my experience regarding soap shampoos is of little value, because we in Denmark have very hard water, rendering the soap type shampoo unsatisfactory and not very popular. For the manufacture of liquid soaps, however, I know how useful glycerine is. If it is not already present in the product as a result of saponification of fats, it simply may be added. Practically all formulas for soap shampoos in the literature contain glyc-

(Continued on Page 2)

HEAT-WAVING, DYEING, REMOVING AND STRAIGHTENING

by Dr. R. Heilingotter

HEAT-WAVING. The incorporation of "oily" substances into heat-waving lotions is considered beneficial to the hair. In order to minimize hair damage by the action of heat and the alkalinity of heat-waving lotions and to overcome hair dryness, these preparations are often provided with suitable additions of glycerine, especially to those which are applied at higher temperatures. According to Sarensen (1) an addition of half per cent glycerine, especially for difficult to handle, coarse hair, is suitable as a softening medium:

Sodium sulfite	10	parts
Ammonium carbonate	8	"
Ammonia 26%	2	"
Glycerine	0.5	"
Water, to make	100	"

Glycerine serves also to give a desirable lustre to the finish of the hair after it has been treated with the permanent-waving liquid. For the same reason Janistyn (2) suggests the following formula for a heat-waving lotion:

(Continued on Page 3)

erine, which illustrates the necessity of its presence as a clarifier (solubilizer), an antifreeze, a thickener, perhaps a foam stabilizer—as well as a hair conditioning agent.

What has been said above regarding soap shampoos is valid also for soapless shampoos; there will always be a reason for the addition of glycerine to a shampoo. I have in my own practice successfully used it as a bodying agent and an antifreeze in a liquid shampoo for hair-dressers, and in a cream shampoo based on Sodium laurylsulphate (in an amount of circa 5%) to prevent granulation of the cream during storage.

RINSES. In the days of soap shampoo, a hair rinse was simply a solution of a weak organic acid, used to dissolve the deposit of lime soap that would otherwise leave the hair dull and without lustre. Today a hair rinse is used to bring about better setting properties of the hair, to prevent fly-away after-shampoo effect, and eventually bring about brilliance to the hair. To promote that, a modern rinse will have to contain a cationic agent, a humectant and some oily substance. It may be presented to the customer as a one-use-pack or in larger bottles. It will appeal most to the buyer, if it has a creamy appearance, looking more "nourishing" than the plain clear solution. It may be provided with a suitable dyestuff, making a color rinse. Here is a simple emulsion to be used as a starting point for further development:

HAIR RINSE

Ethoxy lauryl ether	5	Glycerine	4
Heavy white oil	16	Ethanol 96%	16
Laurylpyridiniumchloride	0.2	Water	58
Polyvinylpyrrolidone	0.8	Perfume to suit	

The mixed oil and emulsifier are stirred during slow addition of the water. When the emulsion is finished, add the rest, and finally the alcohol.

LOTIONS AND TONICS. The same role is played by glycerine in alcoholic lotions in building a moist film around each hair shaft. Here partial dehydration is often brought about by the plain alcoholic solutions of perfume. A humectant helps eliminate this. The amount of glycerine in alcoholic hair lotions (if containing vegetable extracts or drugs generally called tonics) may vary from 2-12%, increasing with the water content. If kept at a reasonable ratio to the water (not over 1:4) in the lotion there is no risk of making a too heavy and slowly penetrating preparation. Glycerine will make the hair soft, supple and brilliant. In certain cases it even will help in keeping the perfume in solution and the lotion crystal clear.

HAIR RECONDITIONING CREAMS. The defatting action of the modern shampoos and the more and more frequent practice of dyeing and waving treatments with serious consequences to the hair and the scalp have resulted in a still increasing demand for preparations with the capacity of restoring the hair qualities lost during the mentioned proceedings, as for instance lustre, suppleness and softness.

Usually reconditioning creams contain lubricants (petrolatum, mineral oil, fatty esters, etc.), body giving substances (fatty alcohols, waxes, spermaceti), nutrients (lanolin, lecithin, hair hydrolysates, linoleic acid), emulsifiers, and humectants such as glycerine. The following formula for a hair reconditioning cream, which is very easy to make, simply by stirring the two phases together at a temperature of 70° C, perfume, cool and pack, gives a rather stiff cream, which the hairdresser must dilute with water to a semifluid emulsion before applying it to the hair after shampooing or permanent waving.

Cetostearyl alcohol	20	Sodium laurylethoxy-sulphate	1.5
Hydrogenated sperm oil	2	Glycerine	5
Soya lecithin, extra light	1	Boric acid	0.5
White oil	3	Polyvinylpyrrolidone	0.5
Isopropyl linoleate	2	Water to make	100

Perfume, colour, preservatives q.s.

As the cream is intended to be rinsed out of the hair after having been in the hair as a treatment for about 15 minutes, the glycerine content is here kept as low as 7% of the water phase. At that level it is believed to have a good chance of penetrating into the hair shaft, remaining there after rinsing and exercising a softening, swelling and humectant action in the hair. Using too high a content of glycerine will result in reduced penetration.

Besides this "treatment" property of glycerine, it also adds to the keeping properties of the cream—which, as it will be used in hair dressing salons, probably will be packed in jars, and consequently be prone to drying.

FIXATIVES AND LACQUERS. The purpose of these two types of non-greasy hair dressings is the same, the difference principally based upon their way of application. While hair fixatives are applied to the hair before—and aiding in—the setting, the lacquers are sprayed onto the hair after the coiffure has been finished. Colloid substances are in both cases used as binders and film formers for the hair. In fixatives they are mostly gums, in hair lacquers shellac or resins, and as the hair lacquers must be sprayed, they must be of low viscosity, while the fixatives are of the gel-type or high viscous lotions.

Gums, shellac and resins are usually rather brittle substances, which have to be plasticized to avoid the unpleasant flaking of the film, which in bad cases looks like dandruff. Here again we can take profit with glycerine: as a plasticizer and softener for the film-building substance, as a conditioner for the hair, so it looks more supple and is easier to set, and as an aid in redissolving the film, either for resetting of the hair with a moist comb or in a desired removing of the film.

The hair fixative is a very nice semi-gel, easy to apply and really corresponding to its name of fixative:

High viscosity sodium alginate	9	Ethanol 96%	15
Glycerine	3.2	Perfume (water soluble), colour preservatives	q.s
Water, to make		100	

Disperse the alginate in alcohol and glycerine. Add the water and when smooth, the perfume. It is most convenient to fill it into wide necked bottles immediately after the mixing, as it gets pretty viscous in a couple of hours.

DRESSINGS. In the last decade, the old fashioned liquid brilliantines (consisting mainly of vegetable and mineral oil) have been outclassed by the cream-type hair dressings, principally manufactured as the well known borax-cold creams, the difference being a lower melting point of the wax-oil mixture and eventually addition of further emulsifiers. Such creams are virtually mixed-phase emulsions, with a tendency to drying when exposed to the atmosphere, so a glycerine addition will be of benefit for keeping qualities. Further it will be of aid in the manufacture of oil in water creams, manufactured with the modern synthetic polyglycol ether-emulsifiers.

Here is a formula for an oil-in-water cream, easy to spread, giving a nice lustre to the hair without being too greasy. The glycerine will, together with the emulsifiers, help re-emulsification of the fatty substances during shampooing, an advantage which is often missing in hair creams

NOTE: Inclusion of formulations in this series of articles does not constitute a recommendation by G.P.A.—nor warrant that they are free from patent or other legal restrictions.

and almost always absent in liquid brilliantines. The cream is suitable for packing into tubes, but because of the nonionic emulsifier, the preservative must be selected very carefully.

HAIR CREAM (dressing, grooming cream)

Stearic acid	6	Isopropyl myristate	12
Spermaceti	6	Light white oil	20
Glyceryl monostearate	2	Triethanolamine	0.8
Ethoxy lauryl ether	2	Glycerine	4.2
White petrolatum	6	Water, to make	100
Lanolin	2	Perfume, preservative	q.s.

Melt together the waxes and oils; mix the water phase. When both phases at a temperature of 70°, gradually pour water phase into oil-phase, while stirring slowly. Continue stirring till cool; add perfume at ca. 45° C.

(Continued from Page 1)

HEAT-WAVING, DYEING, REMOVING AND STRAIGHTENING
by Dr R. Heilingotter

Ammonium sulfite, 22° Be	1.0	Triisopropanol aminoleate, 25%	2.0
Ammonia, 0.910	20.0	Nekal	0.1
Glycerine 28° Be	2.0	Water, dist.	73.0
Polyethylene glycol	2.0		

The addition of glycerine to cold-wave lotions has not been found as necessary because of the self-softening action of the active ingredients of such solutions, but some home-wave lotions contain thioglycerine as active agent in alkaline medium. Glycerine, in this case, is used as raw material for the synthesis of the thio compound.

Recently, weakly acid or nearly neutral cold-wave lotions have been introduced. One of these preparations (3) uses thioglycerine without any addition of ammonia or another alkali, at a ph of 4 to 6. Thioglycerine can be prepared from glycerine-glycid (epichlorhydrin) and hydrogen sulfide or barium sulfide, according to Smith and Sjoeberg (4) or by Morell (5) from a mono-chlorhydrin with potassium sulfide or hydrogen sulfide.

Acid cold-wave lotions may also consist of mercaptan carbonic esters, containing at least one hydroxyl group in the molecule, at a ph of 4 to 7, according to Richter (6). In this case glycerine-monothioglycolic ester and/or similar other esters are used and glycerine is necessary as raw material to produce this compound.

A completely different way to produce heat-permanent waves eliminates electrical energy to obtain the curling effect together with usual alkaline heat-wave lotions by replacement of the electrical heat by chemical heat. Use is made of combinations of chemicals to give sufficient heat by chemical exothermal reaction, if moistened. Besides other combinations an oxidative reaction between permanganates and glycerine or other oxidizable substances, has been found as particularly effective. This has been described by Bonat (7) and Francis (8).

HAIR DYEING. Glycerine is often used in hair-dyeing preparations, for example, in a "Henna liquid shampoo" described by Jannaway (10):

Soapless shampoo base	20 to 30%	Lawsone, synthetic	0.08 %
Lactic acid	0.5 %	Alcohol	10.0 %
Glycerine	5.0 %	Water, to make	100 %

Glycerine has been of special importance to the manufacture of metallic hair-dyes. An addition of glycerine to hair restorers is usual to keep them humid during application. Creamy preparations of this kind are intended to provide an additional amount of glycerine, according to Jannaway (11):

Emulsifying wax	10 g.	10 g.		Copper chloride	0.5 g.	—	
Cetostearyl alcohol	5 g.	5 g.		Lawsone, synthetic	0.02g.	—	
Liquid paraffin	8 g.	— g.		Indigo, soluble	0.1	—	
Glycerine	5 g.	6 g.		Water, dist.	68.0	75	g.
Lead acetate	3.4 g.	4 g.					

Modern oxidation hair-dyes are today mostly manufactured as cream or jelly in a consistency suitable for tube filling. The cream hair-dyes have been the first of this type and have been introduced on the market by Stroher (12). As a cream base, glyceryl monostearate has been used and many imitations utilize the same emulsifier, alone, or in combination with other fatty compounds able to form an emulsion. Glycerine is necessary to produce glyceryl monostearate. This emulsifier is not only in use to prepare cream oxidation hair-dyes but also to produce cream color rinses.

Liquid color rinses, which have the same duty, to give a light coloring effect to the hair, are prepared with addition of glycerine, conforming to a formula, given by Jannaway (13):

Chamomile extract	12.0 g.	Glycerine	2.5 g.
Rhubarb, conc. infusion	3.0 g.	Chamomile oil or compound	0.5 g.
Lawsone, solution 1%	2.0 g.	Water	80.0 g.

HAIR REMOVING. Glycerine is also used in depilatory preparations in appreciable amounts; they are mostly offered as cream products. Glycerine gives softness and suppleness, preventing drying during application to the skin. In general depilatories are not declared skin compatible preparations since they attack not only the hair, but also the skin, making it rough and brittle. Glycerine has to counteract this disagreeable, secondary effect. The following formulas, according to Winter (14), show that glycerine is useful in considerable amounts:

Strontium sulfide	30	27	Lanolin, anhydr.	—	8
Calcium sulfide	—	3	Glycerine	10	8
Calcium carbonate	15	—	Water	30	25
Gum tragacanth	—	0.3			
Starch	15	5		100	76.3

Also in the modern cream depilatories based on thioglycolates glycerine is used in appreciable quantities, as the formula of Keithler (15) shows:

Calcium thioglycolate	6%	Sea Kem Type 11	2%
Carbowax 6000	9%	Alcohol	5%
Glycerine	10%	Water	47%
Zinc oxide	20%	Perfume	1%

HAIR STRAIGHTENING. It is a fact that individuals with straight hair want curly hair and the individuals with curly hair believe straight hair to be more desirable. But to the great percentage of individuals with natural curly hair, hair straighteners have become today more and more important. An ancient method was that of plastering down the hair by the use of gums or resinous-fatty vehicles. Later on an alkali type of straightener came into use; these formulas contain glycerine:

Sodium hydroxide	4	10	Oleic acid	—	5
Glycerinmonostearate	16	—	Glycerine	5	5
Stearic acid	—	15	Water	75	65

In modern preparations, thioglycolates have been used for hair straightening. Such preparations contain 1 to 12 per cent thioglycolic acid; sufficient alkali, for example ammonia to form ammonium thioglycolate; an organic amine, such as ethanolamine to produce sufficient alkalinity; ingredients able to give viscosity and adhesion, such as alkylcellulose, alginates, polyvinyl alcohol, Carbowax and suitable other products (16). Another suggestion by Morelle (17) uses thiolactic acid together with a water soluble non-toxic alkali, jelly forming compounds and water. In both formulas an addition of glycerine seems to be desirable.

Bibliographies available upon request.

advertisement

INVITING NOMINATIONS FOR THE

1960 Glycerine RESEARCH AWARDS

BASIC SCIENCE AWARD $750

APPLICATIONS AWARD $750

These annual awards were established in 1952 to recognize research advances in the basic science and applications of glycerine and glycerine derivatives. *Science* award entries may deal with the chemical, physical or physiological properties of these materials. *Applications* award entries may deal with actual or projected uses; or with scientific principles likely to stimulate future applications. In both awards originality in extending the usefulness of glycerine into new fields will receive special consideration.

BASIS OF ENTRY—These awards are open to any individual in the United States or Canada engaged in research or product development, either in industry or with government or educational institutions. Entries by research teams of two or three associates are eligible.

First consideration will be given to work which has come to a clear-cut point of accomplishment during the current year; but work carried on in previous years, the significance of which has been confirmed by commercial application in 1960 also will be eligible.

Entries will be judged by a committee of outstanding reputation and scientific background, having no connection with the Association or its members.

METHOD OF NOMINATION—Nominations must be made on the official entry blanks, which may be obtained by writing to: Awards Committee, Glycerine Producers' Association, 295 Madison Avenue, New York 17, N. Y.

All nominations for the 1960 awards must be received by November 1, 1960, to be eligible.

important data on Glycerine

"Glycerine Properties•Reactions• Performance" is a new twenty-page working booklet for anyone interested in Glycerine. It describes all commercial grades and types. It covers storage, shipping and handling and a variety of glycerine's 1500 known applications.

For the chemist, this new booklet includes convenient technical data on hygroscopicity, vapor pressure, solvent power, etc. These are presented under twelve headings with nine charts and tables. Reactions not found in older literature are described.

We'd like to send you a copy of "Glycerine Properties•Reactions• Performance". It may suggest new areas of usefulness to you.

Address your request to the Glycerine Producers' Association.

GLYCERINE PRODUCERS' ASSOCIATION • 295 MADISON AVENUE, NEW YORK 17, N.Y.

"Have you time to see a detail man?"

Keeping Posted

New Medical Publications

Two more publications having to do with the medical profession are getting under way. One of these, which began March 17, is a bi-monthly called the *Doctor's Wife*, and the other one, starting April 15 with Morris Fishbein as editor, is a fortnightly called *Medical World*. However, *Medical World* is said to have a controlled circulation of 142,000 physicians—every practicing physician in the country, while *Doctor's Wife* claims a controlled circulation of 180,000. We just wonder where all these extra wives come from—and certainly there must be some bachelors among the doctors.

Doctor's Wife is being published by Ellery W. Mann, Jr., who resigned as vice-president in charge of advertising for Tampax, Inc., in 1959 to join two others in buying *Rudder*, the oldest boating publication in this country. *Medical World* is being published by Medical World Publishing Co.

Advertising rates are interesting; *Doctor's Wife* is quoting $1,800 per black and white page (429 lines), and *Medical World* is quoting a one-time black and white page rate of $1,750. *MD*, the monthly news magazine, has a basic rate of $1,500 for a circulation of 140,542. The *Journal of the A.M.A.* has a rate of $1,210 for a paid circulation of 168,899. *Medical Economics* has a basic rate of $1,145 for a controlled circulation of 153,794. *Modern Medicine* gets $1,000 per page for a circulation of 144,000.

Pharmaceutical Research Discussion Group

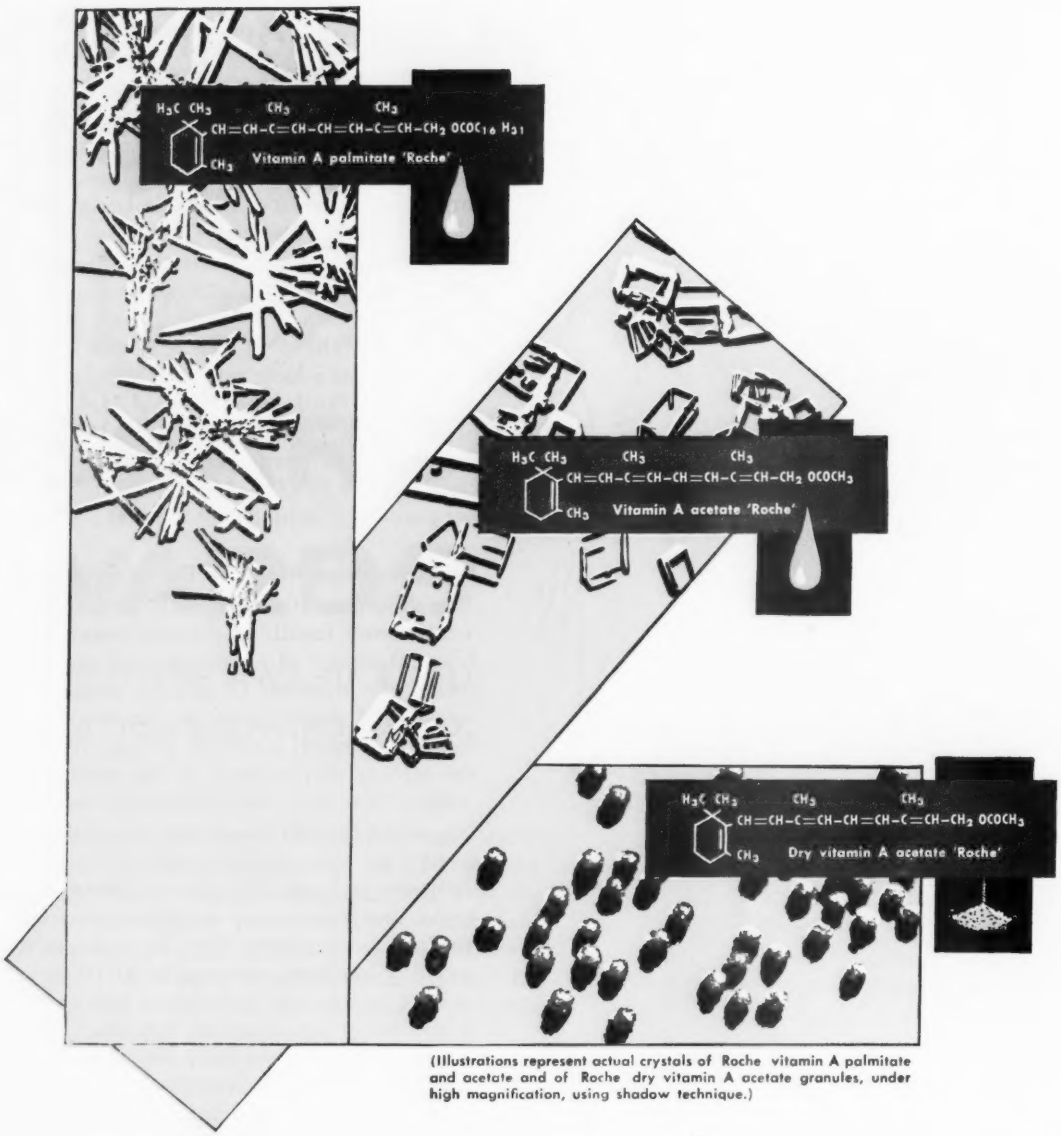
The Pharmaceutical Research Discussion Group, which meets monthly to discuss informally nonconfidential aspects of pharmaceutical product development, now numbers 27 persons responsible for research and development of pharmaceutical dosage forms, and seven academic persons representing all the schools of pharmacy in the metropolitan New Jersey, New York and Philadelphia areas.

Organized in 1955, the Group has as its primary objective the informal discussion of various pertinent technical and administrative problems of special interest and importance to persons engaged in new product development. This is accomplished during monthly luncheon meetings, at which time a specific subject for informal discussion is introduced by either a member or by an outside speaker. This is followed by an informal round-table discussion with all members participating by contributing general, nonconfidential information, citing personal experiences, or discussing literature references.

Typical of subjects discussed during the past year are: radio-activity as a tool in pharmaceutical research and development; the value of the purchasing agent to the pharmaceutical development department; the present status of compression coating; problems in the development of sustained release medication; relationship between product development and production; pharmaceutical dry mixing; and new developments in pharmaceutical areosols.

Officers for 1960 are: chairman, Harold Sheinus of Carroll Dunham Smith; secretary-treasurer, Frank Reinish of White Laboratories; and the steering committee, Charles Jarowsky of Pfizer.

Membership roster includes: Akira Asano, J. & J.; Kenneth Avis, Philadelphia College; Andrew Bartilucci, St. John's University; Louis Blubaugh, Squibb; Roy Bowers, Rutgers University; Vincent Coletta, Bristol Myers; Jack Cooper, Ciba; William Ebert, Lemmon Pharmaceutical; Lyman Fonda, Brooklyn College; Edward Hanus, Merck; George Hoffnagle, Vick Chemical; Charles Jarowski, Pfizer; Bernard



(Illustrations represent actual crystals of Roche vitamin A palmitate and acetate and of Roche dry vitamin A acetate granules, under high magnification, using shadow technique.)

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Accounting Jargon

H. J. Sanders of Sanders Prescription Pharmacy has sent us a letter he received from one of the leading pharmaceutical manufacturers. Mr. Sanders states: "We simply wrote a note and inclosed a check to bring our account in balance. A reply simply stating, 'Check received and you now owe us only December purchases,' would have been sufficient and explained all that is contained in letter." But wait till you read the letter:

"Thank you for your letter of December 21st showing an itemized statement of a balance due us.

"In your statement you note you overpaid $24.13. This is not so. You must remember that your October purchases were for $229.87 less the discount of $4.59 and the net amount is $225.28. However, you must remember that you were entitled to that 2 per cent discount, therefore, we posted the gross amount of $229.87. Consequently you only overpaid $19.54. You do not subtract the difference between your check and the net balance, but the difference between your check and the gross amount. The same applies to your December check for $75.01, although it should have been $74.61 we allowed the 40 cents. There again we posted the net amount of $86.54 which covers our November invoice for $96.08 less 2 per cent discount of $1.93, total $94.15, less the credit balance of $19.54, or a net balance of $74.61.

"As your account stands now, you only owe us for December invoices of $6.89 and $144.65 totaling $151.54. If you will review your letter of December 21st, you will find that you did not take into consideration the 2 per cent discount in both instances, and, therefore, you are not entitled to the large overpayment. If there are any questions regarding your account, please do not hesitate to write and I will explain further.

"We are enclosing a duplicate statement for your convenience."

New Pharmaceutical Introductions

Two-thirds of all new pharmaceutical products introduced during 1959 were marketed by firms having less than full national distribution, says pharmIndex. A total of 564 products is said to have been introduced by 208 drug companies, of which 75 per cent had less than full national distribution—a group of manufacturers which introduced 63 per cent of all the new items released. These figures consider only new pharmaceuticals and include no new dosage forms, package changes, or other variations of previously introduced items.

Only one of three new pharmaceutical products came from some 50 national firms in 1959, claims pharmIndex. The new items introduced by 63 per cent of the manufacturers who marketed only one or two new items accounted for almost one-third of all new products. Increasing the number of new items to three, raises the figure to include 76 per cent of the manufacturers.

Only five U. S. manufacturers (2.4 per cent of those introducing new products in 1959) marketed ten or more new pharmaceuticals and these ten firms introduced just 10 per cent of all new products. The most productive companies were two firms each of which introduced 15 new products, but they introduced only three per cent each of the new ethical products of the industry.

"Obviously, monopoly does not exist in an industry whose 'giant' produces only 3 per cent of its total new products," comments pharmIndex. "Obviously, an industry in which two-thirds of all new products are marketed by smaller firms is alive—with both cooperation and competition."

Fair Trade Domestication

The State of New Jersey is putting fair trade back where it was before the passage of the first federal enabling act—the Miller-Tydings Act—which exempts manufacturers from violation of the federal antitrust laws in operating across state lines in enforcing fair trade prices in the states that had fair trade laws. Prior to the enactment of the Miller-Tydings Act, a manufacturer was required to domesticate in each and every state in which he desired to operate under a fair trade statute. This many manufacturers refused to do. Then, when the Miller-Tydings Act was invalidated by the U. S. Supreme Court, fair trade broke down completely, and was restored only after the enactment of the MaGuire Act by the Federal Government.

But the Supreme Court of New Jersey, in a 6 to 1 decision, has upheld a lower court decision against Eli Lilly and Company that this firm cannot enforce fair trade agreements if it does not register in that state. The state said that Lilly has not registered as a New Jersey corporation, and thus has escaped paying New Jersey corporation taxes. Lilly said that it does not do business in New Jersey, although Sav-On-Drugs, Inc., of Plainfield, whom Lilly sought to restrain, said Lilly has 18 detail men to provide information to New Jersey druggists, and claimed the registration law of New Jersey is unconstitutional if it does not bar Lilly from enforcing fair trade agreements.

Former Superior Court Judge Everett M. Scherer

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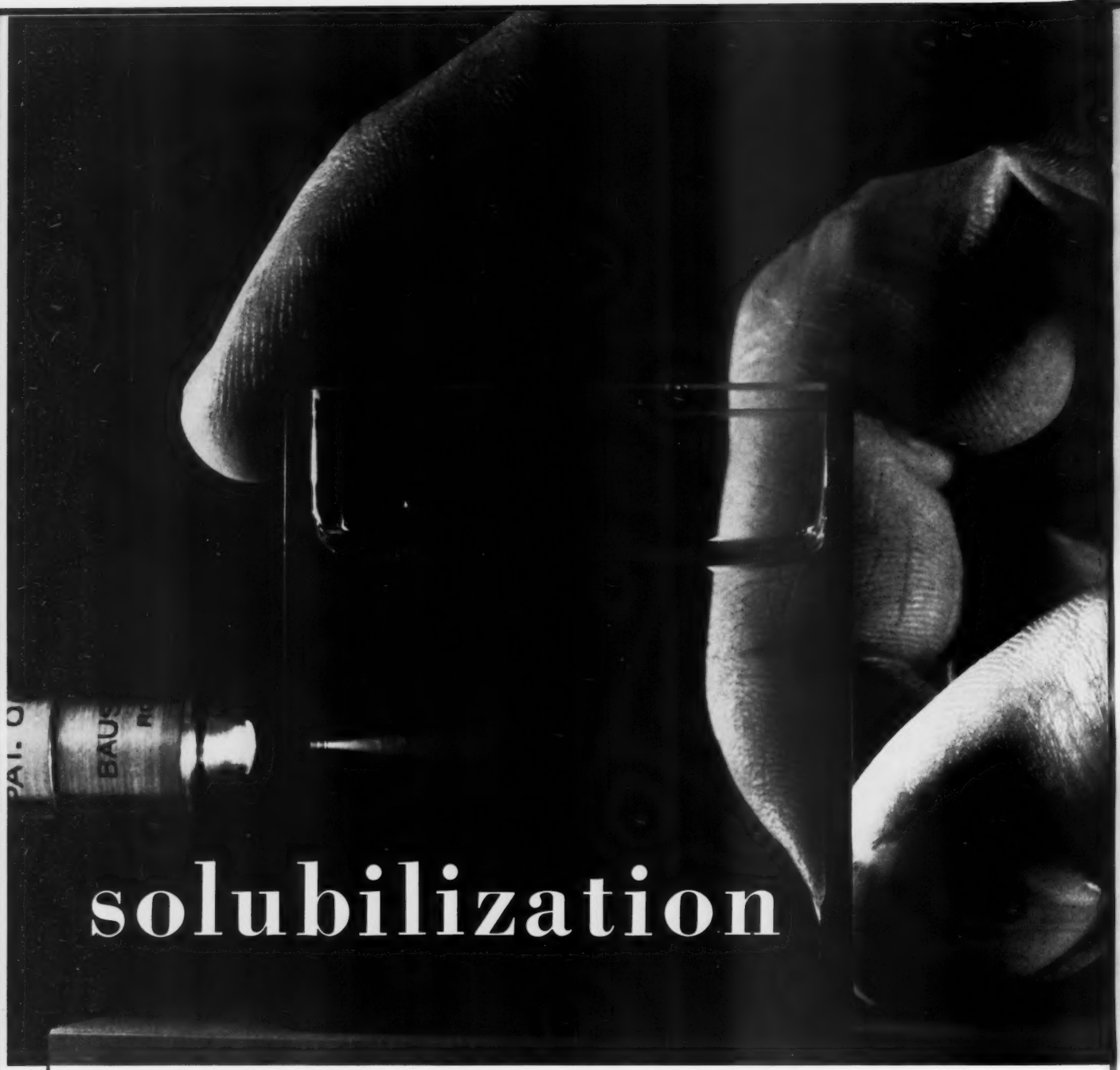

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You can prepare sparkling clear "solutions" of insoluble perfume oils by using TWEEN emulsifiers for "solubilization" of the oils. These hydrophilic products reduce or eliminate your use of alcohol or other costly solvents, not only saving you money but also preventing evaporation loss. And no filtration is usually needed. This is one of the many ways that the unequalled store of surfactant technology and the comprehensive line of emulsifiers available from Atlas can assist you in cosmetic formulation. For application information on your problem in emulsification or solubilization, write Department PC.

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had ruled that a corporation which does not file in New Jersey "should not be permitted to take advantage of the laws of this state which promote its business, such as the Fair Trade Act." He held the registration law to be constitutional.

Although a fair number of drug and cosmetic firms are resident in New Jersey, there are many more who are not. With New Jersey and New York being two adjacent states in which fair trade has been solid as a rock, at least from the legal viewpoint, what is to happen now? This decision is apt to make fair trade in New Jersey a comparatively dead issue. How long can fair trade in New York stand up under these circumstances?

This is certainly a new approach to the killing of fair trade. As an old chemistry professor of ours used to say: "There's more than one way of skinning a cat than choking him to death with butter."

Ethical Pharmaceutical Employment

The ethical pharmaceutical industry employs about 118,000 persons in the U. S., about 62,000 overseas, and has approximately 2,430,000 stockholders, says the Pharmaceutical Manufacturers Association. This information comes from a questionnaire survey to which 87 firms doing about 95 per cent of the business responded. Figures they supplied were increased to reflect the full industry picture.

Drug Reactions

The Food and Drug Administration has tried for several years to obtain voluntary reports from hospitals on unanticipated side reactions from new drug products, but this effort has not been very successful. However, the FDA now has $35,000 to pay internes in ten hospitals to obtain this data and send reports. FDA is of the opinion that some side effects like rashes or allergic responses that ordinarily go unnoticed in preliminary testing will be brought to light. Such information could bring about new label warnings and possible restrictions as to use.

Parke, Davis Division Moving South

Parke, Davis & Company is planning to locate its surgical dressings manufacturing operation on a 100-acre site in Greenwood, South Carolina. The firm's Bay Division, which produces these items, is located in Bridgeport and Versailles, Conn., but T. C. Anderson, Parke, Davis vice-president and director of production and engineering, told Bay Division employee: "The new site is strategically located with respect to markets, transportation, power, water, and, most importantly, our principal raw materials, cotton and gauze." He informed them that if they wished to continue with the company they would be given priority consideration at the new location.

The Bay Division produces a line of more than 60 products, including adhesive tape, absorbent cotton and gauze products, and hospital specialty items.

SK&F Research and Expansion

Smith Kline & French Laboratories has budgeted $13,500,000 for research for 1960, compared with $12,100,000 spent in 1959, which amount was approximately 9 per cent of sales for that year. The company says that a considerable portion of these funds has been and continues to be allocated to several major research programs: (1) neurological, which includes studies in areas such as tranquilization, central nervous system stimulation, analgesia, and muscle relaxation; (2) cardiovascular, which has as its target new and effective antihypertensive agents; (3) metabolic, which searches for compounds that affect the activity of such internal organs as the thyroid and adrenal glands; (4) natural products, which encompasses a world-wide search for physiologically active compounds from botanical sources; (5) structure function, which represents an approach to new drugs through synthetic organic chemistry; (6) chemotherapeutic, a relatively new research area for the company, which includes testing of compounds such as antivirals, antibacterials and antifungals.

The company is spending $6 million this year for capital expenditures in this country and abroad. This expansion includes addition of three floors to the main building in Philadelphia, to provide for additional laboratories and offices; expanded vaccine, virology, and toxicity buildings at the Upper Merion, Pa., research location; construction of a new biological production unit at Norden Laboratories; new facilities at Johannesburg, South Africa; and acquisition of land for expanded operations in North Sydney, Australia.

Society of Cosmetic Chemists

The 1960 Special Award of the Society of Cosmetic Chemists and its prize of $1,000 will be awarded to Dr. Aaron Lerner, professor of medicine, Yale University School of Medicine, during the Society's semi-annual meeting to be held May 12, at the Biltmore Hotel in New York. The award was conferred on Dr. Lerner in recognition of his work on enzymes and hormones controlling skin pigmentation. He is considered a pioneer in the study of melanin, and was instrumental in the isolation of two melanocyte-stimulating hormones from hog pituitaries. His work also demonstrated the similarity of these hormones obtained from man to that obtained from other species.

Keynoting the program of the Spring meeting will be Dr. G. Robert Clark, an honorary member of the Society, and director, Division of Cosmetics, Food and Drug Administration, who will outline current problems of concern to the Administration and the industry. Scientific papers will include the following:

The Pathogenesis of Alopecia, by Dr. Norman Orentreich, New York; The Assay of Lyophilized Placenta Extract, by Dr. William Colburn, Colburn Laboratories, Chicago; Effect of Vehicle Components

SCENTS
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and Sebum Constituents on the Absorption Characteristics of Sun Screens, by Dr. Sydney Reigelman, College of Pharmacy, University of California, San Francisco; Molecular Forces in Permanent Waving, by Herman Bogaty, associate research director, The Toni Company, Chicago; Non-Aqueous Foam Propulsion Systems, by David S. Tillotson, Pennsalt Chemicals, Chestnut Hill, Pa.; The Use of Ternary Diagrams in Cosmetics Formulations, by R. James and R. Goldemberg, Shulton, Inc., Clifton, N. J.

Pharmaceutical Foot Warmer

A new preparation to be taken by mouth which will then warm cold hands and feet has been introduced by Lakeside Laboratories under the name of Geriliquid. Each spoonful of Geriliquid contains 75 mg. of niacin and 750 mg. of glycine in a palatable sherry base with an alcoholic content of 5 per cent.

Extra calories produced by glycine metabolism in the liver cannot be used by the body and is radiated to the extremities by way of increased blood circulation in the hands and feet. Niacin has a more immediate but less sustained action than glycine, and facilitates the transport of glycine-produced heat from the liver to the extremities.

Will Geriliquid ever replace a husband or wife?

Abbott Laboratories Research

Abbott Laboratories spent $6.9 million for research in 1959, or about 5.6 per cent of sales. This was 20 per cent more than was spent in 1958, when expenditures amounted to about 5 per cent of sales. The amount budgeted for 1960 is about 20 per cent higher than that spent in 1959, or about $8.3 million. Abbott research encompasses most of the broad areas of medicine. Thousands of soil samples are anlyzed each year in a search for antibiotics more effective than those now available. Studies of cardiovascular diseases have led to several new agents of value in treating hypertension, but Abbott scientists are searching for more specific, safer, and more effective drugs for the management of diseases of the heart and blood vessels. Other current Abbott research projects include the search for agents effective against viruses, mental illnesses, degenerative and metabolic diseases, parasitic diseases, and cancer, as well as research on steroids, nutrition, anesthetics, animal health products, radio-pharmaceuticals, plant growth stimulants, and products for the Chemical Marketing Division.

Aid to Earthquake Victims

Over eight tons of medical supplies valued at nearly $375,000 were contributed early in March by 14 American pharmaceutical firms to help earthquake victims in Agadir, Morocco. Supplies consisted of penicillin, anti-tetanus toxin, antibiotics, bandages, dressings and other products needed to treat the thousands injured in the two earthquakes, a tidal wave, and fires. Houses giving the supplies were Chas. Pfizer & Co., Johnson & Johnson, Abbott Laboratories, Eli Lilly and Company, Parke, Davis & Company, Norwich Pharmacal Company, Wyeth Laboratories, E. R. Squibb & Sons, Hoffmann-La Roche, Inc., Kendall Company, Winthrop Laboratories, Pitman-Moore Company, Baxter Laboratories, Smith, Kline & French Laboratories.

Supermarket Proprietaries

Continued sale of the 18 proprietary drug products challanged in the Minneapolis district court is to be allowed in supermarkets and grocery stores, according to the Hennepin County Court decision. The suit against Red Owl Stores and their supplier, Groves-Kelco by the State of Minnesota for the Minnesota State Board of Pharmacy involved the following products: Anacin, Alka Seltzer, Bromo-Seltzer, Bufferin, Lysol, Pinex, Vick's Cough Syrup, Murine, ExLax, Feen-A-Mint, Sal Hepatica, Castoria, Va-tranol, Aspergum, Thriftway Aspirin Compound Tablets, Bromo-Quinine, 4-Way Cold Tablets, and Pepto-Bismal. The state plans to appeal the decision to the state supreme court.

A ruling by the State Supreme Court in Erie County, New York State, recently ruled that Bayer Aspirin may be sold in nonlicensed outlets in the state. However, the Judge suspended the effective date for 30 days, to permit the state to apply to the Appelate Division for a stay.

Gordon Research Conferences

Gordon Research Conferences, informal meetings consisting of scheduled lectures and discussions concerned with the newest scientific developments, will be held in 1960 from June 13 to September 2 in three locations, for a total of 36 conferences. Of special interest to research people in the drug and cosmetic industries are the conferences devoted to the following subjects.

At Colby Junior College, New London, New Hampshire, Food and Nutrition, Aug. 8 to 12; Medicinal Chemistry, Aug. 15 to 19; Cancer, Aug. 29 to Sept. 2. At New Hampton School, New Hampton, New Hampshire, Proteins and Nucleic Acids, June 27 to July 1; Steroids and other Natural Products, Aug. 1 to 5. At Kimball Union Academy, Meriden, New Hampshire, Lipide Metabolism, June 13 to 17; Cell Structure and Metabolism-Secretion, June 20 to 24; Chemistry, Physiology, and Structure of Bones and Teeth, July 11 to 15; Toxicology and Safety Evaluations, Aug. 15 to 19. Requests for attendance at the conferences, or for additional information, should be addressed to Dr. W. George Parks, Director, Department of Chemistry, University of Rhode Island, Kingston, R. I.

TGA Scientific Section Meeting

At the Scientific Section meeting of the Toilet Goods Association, to be held in the Sert Room of the Waldorf-Astoria Hotel in New York, a vice-chairman will be elected and the 1960 CIBS Award will be

presented at the luncheon. The seven papers making up the program will be: Bernard Davidow, Program for Dermal Toxicity Testing; Bernard Oser, The Rationale and Interpretation of Toxicity Tests; Lloyd Hazelton and John R. Elsea, A Review of Product Development Problems under the Federal Food, Drug, and Cosmetic Act; A. J. Lehman, Toxicological Aspects of Certain Types of Cosmetics; Herbert Heinrich and John Clements, Usefulness of Rheology in Cosmetics; James W. Johnston, Jr., Organoleptic Quality and the Stereochemical Theory of Olfaction; Edward J. Masters, The Percutaneous Absorption of Estrogen.

1970 Doctors

In 1970, the typical doctor will be: a specialist rather than a general practitioner; involved in some sort of group practice; less independent, he will be subject to powerful third parties such as hospitals, labor unions, insurance companies, and government bodies; so inhibited by the threat of malpractice litigation that he will be overly cautious about prescribing any new drugs. These are some opinions expressed by William A. Richardson, president and editorial director of Medical Economics, Inc. before the Pharmaceutical Advertising Club in New York.

Because of increased specialization, the drug company will have to upgrade its detail men, direct mail, and journal advertising even beyond present high levels. Increased group practice will mean that medicine is becoming "less and less a private enterprise and more and more a sort of public utility." Reduced independence of the physician and increased pressures from organizations may have an effect on brand name prescribing, while the threat of malpractice suits may increase caution about prescribing experimental drugs unless manufacturers underwrite the legal risks.

Johnson & Johnson Injunction

All thirteen stores owned by Two Guys From Harrison have been enjoined by the courts from violating fair trade prices established by Johnson & Johnson. The permanent injunction was granted to stop violation of prices, pursuant to the New Jersey Fair Trade Act.

SK&F Foreign Fellowship Program

A unique fellowship program designed to further medical education by sending future doctors to remote areas of the world has been announced by the Association of American Medical Colleges.

Dr. Ward Darley, executive director of the AAMC, said the program would "enable selected medical students to gain wide clinical experience, as well as assist in the continuing war against disease in the backward areas of the world."

The three-year program, established under a $180,000 grant from Smith Kline & French Laboratories, is open to all medical college students who have completed their third year of study. Scheduled to begin this Summer, the program will permit an average of 30 students to participate each year.

"This unique program opens the way for these students to learn more about their profession in alien settings," Dr. Darley said. "The medical opportunity inherent in working with dedicated men already practicing in Africa, Asia and other far-off places provides a first-hand experience in the care of patients that cannot be obtained in the formal academic environment."

Parke, Davis Dedicates New Laboratories

Parke, Davis and Company dedicated its new $13.5 million research laboratories at Ann Arbor, Mich. on April 19, in conjunction with its annual meeting of stockholders. This is the first time in the history of the company that the annual meeting has been held outside of Detroit, and the dedication was limited to shareholders and invited guests.

The new research facilities—a five-building complex, the largest of which contains 147 laboratory, animal, and utility rooms—are located on a 50-acre site four miles from the center of Ann Arbor, and are now in full operation.

Other Parke-Davis research operations are located at the company's main offices in Detroit and at Hounslow, England. A new veterinary research laboratory is under construction near Sydney, Australia.

Approximately 350 persons, almost half of the total research group, are based in Ann Arbor. Of contemporary design, the exterior walls of the buildings are predominantly of glass and anodized aluminum and are air-conditioned throughout.

Squibb "Fight Back" Campaign

E. R. Squibb & Sons' "Fight Back" campaign to help the druggist keep the vitamin business in pharmacy was launched nationally in 1956. Today, Squibb is carrying that campaign directly to the public with an aggressive and major promotional program on Vigran, a Squibb multi-vitamin capsule. Its theme, to be projected nationally on TV, radio and newspapers, establishes the drugstore as vitamin headquarters.

Since the start of the program, Squibb has made available leaflets, pamphlets, invoice stuffers, windows, interior displays, and clerk training material, and has backed this up with magazine and television advertising of an institutional nature. Each year the program has gained momentum and has helped to stem the tide of nondrug vitamin competition.

An advertising program was developed and successfully tested in six markets last fall. This program stresses the importance of quality control to avoid vitamin deficiency in the bottle, and points out that the safest way to buy vitamins is to be sure of the integrity of the manufacturer; to buy the product of a reputable pharmaceutical house and buy it from the druggist.

PHARMACEUTICAL RESEARCH
Success through Failure*

BY C. WESLER SCULL, Ph.D.
RESEARCH AND DEVELOPMENT DIVISION,
SMITH KLINE AND FRENCH LABORATORIES, INC.

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MAY 4 1960
PITTSBURGH, PA.

The most recent census, taken in 1950, disclosed a rather surprising statistic. Living in the United States were 10 million more people than the Census Bureau had expected to find. At least a third of these people were alive because of drugs that had become available since 1940. Today, 70 per cent of the prescriptions physicians write are for drugs that weren't available as recently as 1950, and many of them are used to treat diseases that at the time could not be effectively treated at all.

In 1939, the ethical pharmaceutical industry spent about 15 million dollars for research; in 1956, it spent 110 million; in 1960, it will spend about 200 million. A larger and healthier population—the elimination or control of many once fatal diseases, all due in no small measure to the increasing effort, skill, and productivity of pharmaceutical research—makes an impressive success story. And it's a true story, so far as it goes. But, because it doesn't go far enough, it is also a dangerous story, a story that has misled many people to accept some very erroneous ideas about research and development.

In general, these erroneous ideas can be classified into two schools of thought: the mystical, and the mechanical. The mystical school thinks of *true* research as an almost religious experience, the true researcher as a contemplative dreamer to whom new knowledge is revealed in a flash of intuition. Only this original creative act can be dignified by the name of research.

In pharmaceutical research, the mystical school holds that only the discoverer of a drug—the medicinal chemist who first synthesized it—is really engaged in research. What are all those other people doing? The biochemists, organic chemists, microbiologists, pharmacists, physicians and biostatisticians, the investigators of the new drug? Aren't they doing research too? No. All they're doing is a simple something called putting the drug in a bottle—a mere development job.

The mechanical school, on the other hand, while it recognizes the existence of the brilliant originators, the Flemings and the Kendalls, isn't at all convinced of their essential importance. To this school, research is an orderly, predictable, well-defined process. It's *science* isn't it? Science, by its very nature, is an ordered method of thought. If you follow the rules, you get results.

People who hold to the mechanical school are convinced that if we'd only get more people on the job, more scientists working together, if we'd only spend more money, progress would be stepped up immeasurably. This philosophy adheres to the firm conviction that quality flows automatically from quantity.

Now, both the mystics and the mechanics are right—in a way. They have both taken some truths about science and research and oversimplified, magnified, and otherwise distorted them to come up with theories giving a false picture of what is a tortuous, often maddening activity that does not lend itself to easy description. But just what is the character of pharmaceutical research and development?

The Case of the Vanishing Oriental

Sometimes new chemical health tools result directly from accident or from an inspired thought (here, the mystics are right), or from the combined hard work of many people (here, the mechanics have a point). In short, research is a human activity filled with all the complications human enterprises are subject to—and you know how many that can be.

The story of the last stages of creation and development of successful products is often told. We hear much less about the halting starts, the projects that are wide of the target. We rarely hear anything about successful projects which arrive, but with too little, too late, and turn out to be commercial failures.

Research is not confined to discovery, but extends to the study of how the discovery can be made of practical value. No medical discovery is ever entirely original. Modern steroid therapy, for example, can truthfully be called a product of Merck research and development. But the basic compounds, steroids, weren't discovered originally by Merck scientists, but by Kendall of the Mayo Clinic and Reichstein, a Swiss scientist, both of whom shared a Nobel prize for

*Presented at the annual Pharmacy Seminar at Wayne State University, sponsored jointly by the Michigan Branch of the American Pharmaceutical Association, the Pharmacy Alumni Association, and the College of Pharmacy of Wayne State University, February 1960.

their work on cortisone and other steroids. Kendall and Reichstein, in turn, owe more than a passing debt to Addison who in the 1850's discovered that adrenal lesions cause the disease which bears his name. And *all* who work with steroids are indebted to the researcher who first described the adrenal glands—a man named Eustachius who published his report in the sixteenth century.

In research, recognition plays as important a role as discovery. The most wonderful invention in the world is, in effect, nonexistent if its potential worth isn't recognized and developed. Many examples could be used to illustrate this point. The most recent one I've run across was given by Arnold Toynbee, who wrote that ancient Romans delighted in playing with a fascinating toy that, had its potential worth been recognized, might have helped hold together Rome's sprawling and disintegrating empire. The toy? A small steam turbine.

The ability to judge the as yet uncertain value of an original discovery is essential to the process of making those secondary, though vital, discoveries necessary to transform what may be an abstract theory into a practical benefit. We call research leading to secondary discoveries "development," a term that to some people has the derogatory connotation of unoriginal, routine hack work. Yet, much original and creative work in the pharmaceutical industry occurs in the clinical, pharmacological, and pharmaceutical work necessary to transform a new chemical compound into a usable, worthwhile medication.

You could never guess how infrequently we do come up with the right answers if you listen to some critics of the pharmaceutical industry. The story the industry tells most often is a success story—the Horatio Alger-like tale of the hitherto neglected or undiscovered compound that wins fame and fortune. The oft' told success story may be partly responsible for some of the recent and well-publicized adverse criticism of the industry. In a game where failure is rare, it seems a little dishonest to reap the rewards of success. Is failure rare? No! As Furness Thompson, the vice-president of our Research and Development Division once put it: "In research, failure is the order of the day. Failure is our most important product."

I know Mr. Thompson well enough to realize that I do not dare let this striking phrase get out of context. Failure is indeed a very, very common and often very expensive product of many phases of pharmaceutical research and development. But a valuable product, because of immediate failure, frequently leads to eventual success.

I'm going to try giving you a picture of what pharmaceutical research and development is like by telling you about some specific research projects—some failures, some successes—tackled by the Smith Kline and French Research and Development Division. I'm telling about ours only because I know them better than those of other houses. They are typical of what goes on in any large drug house.

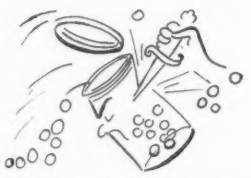
To those of us working in it, pharmaceutical research is an exciting business that, at times, seems as absorbing and as suspense-filled as a mystery story. And that may be why I've succumbed to the temptation of giving mystery story titles to the following case histories.

The Case of the Vanishing Oriental

This is the story of a tricky descendant of *ma huang*, an ancient Chinese herb. In the late 20s the active principle of *ma huang*, ephedrine, was widely used as an oral nasal decongestant. At SK&F, Dr. Fred Nabenhauer, our chief chemist, tried to make a new and better substitute for ephedrine. His first compound, an excellent vasoconstrictor, just wouldn't stay put. A highly volatile substance, it vanished into thin air. This unique combination of properties was turned to good use in the now familiar Benzedrine inhaler later replaced by a safer one, Benzedrex.

Dr. Gorden Alles, a consulting chemist, anchored this volatile compound, phenylisopropyl amine, and made Benzedrine sulfate. An expert pharmacologist told us to forget the drug—it wasn't any good. It was so frustratingly capricious it could not be studied respectably. Why? Well, it ruined a carefully designed experiment to test its effect on the blood pressure of an anesthetized cat. When given Benzedrine, the cat roused itself and jumped up. Our hopes dropped down, but, an imaginative physician suggested that a drug that could arouse a sleeping cat might also keep patients with narcolepsy awake. Benzedrine sulfate was developed and marketed for this one indication.

Later, physicians noticed that, while their narcoleptic patients stayed awake, they also lost the edge from their appetites. To neurologists this side effect of Benzedrine limited its value. But to internists trying to help a patient shed some of his excess weight, this anti-appetite activity proved useful. As a stimulant and as an appetite depressant, Benzedrine, and its successor Dexedrine, turned out to be one of the most useful drugs in medicine.



The Case of the Murdered Drug

What was the cost of SK&F's research on this vanishing oriental? I can't say for sure; because our research funds are allocated to general programs rather than to the specific compounds that go through these programs, it's impossible to pin down the exact amount of money spent on the research and development of any single compound or group of compounds. It seems safe to say, though, that work on the amphe-

tamines had cost well over a million dollars by 1950. Since 1950, by the way, Smith Kline and French has paid a total R & D bill amounting to 70 million dollars.

This case history emphasizes that drugs that are medical yardsticks today do not always carry clear, complete, and attractive labels when they are born in a chemist's flask—or even after they have been out on their own in medical practice for a time.

The Case of the Rats that Played Possum

Our work with mental stimulants led us to consider the possibility of making a drug that would have the reverse action, one that would exert a calming effect on jangled nerves. In 1946, Dr. Edwin Fellows, SK&F's pharmacologist, indulged in some speculation about the possibility of creating a new nonbarbiturate sedative. In the belief that related chemical agents sometimes show pharmacologically opposite actions, he enticed his medicinal chemical colleagues to make derivatives of caffeine. In this series of caffeine congeners, he expected to find that some would, like caffeine, be stimulants; others, unlike caffeine, depressants. He further reasoned that caffeine antagonists might have a calming effect on anxious patients. Extensive chemical manipulation produced a number of compounds which were tested in animals. The tests were unpromising. The project was dropped.

Five years later, in 1951, Dr. Fellows heard of an ingenious, more sensitive pharmacological technique for determining the central depressant action of drugs. Developed by Dr. Winters of Merck, the technique consists of giving an animal a short-acting barbiturate, Evipal, then giving it the test compound and determining whether the sleep induced by Evipal could be extended. Drugs that extended sleeping time might prove valuable potentiators of barbiturates. The "anti-caffeine" congeners were tried in this more sensitive test—again, they failed.

Almost in a spirit of desperation, Dr. Fellows then began to try out old compounds from SK&F shelves that had shown hints of slight depressant actions in dose range studies. Much to his delight, if not surprise, in May, 1951, he found that SK&F #525, the eighth in the testing line-up, which incidentally had been made originally in 1948 as an anti-spasmodic, had a profound potentiating effect on the sleeping time produced by Evipal, extending it by 900 per cent in rats and mice. This effect was so dramatic that a flurry of feverish activity kept SK&F pharmacologists working nights and weekends. Although the echos of this activity sounded all around the pharmacologic world, SK&F #525 did not make headlines in any medical journal. Just at the time when we were checking out the potentiating action of SK&F #525 in man, we got some interesting news about a new drug synthesized by Carpentier, a chemist in the laboratories of Rhone-Poulenc. The compound was a depressant. It was used as an ingredient in a combination of drugs proving useful in surgery and being evaluated for possible use in psychiatry. The combination was known as the "lytic cocktail." The new drug was chlorpromazine.

The Case of the House Built on Sand

Although Rhone-Poulenc was convinced that chlorpromazine was a therapeutically promising drug, this confidence was not shared by others. Without mentioning names, skillful R & D teams of at least two distinguished American pharmaceutical houses were aware of the pharmacologic effect of chlorpromazine, but decided not to develop it into a product. SK&F's R & D Division did decide to follow through, at least in part, because of our very high interest in potentiation.

Because of our preoccupation with potentiation, we first tried to evaluate the drug in combination, but in this we were unsuccessful and frustrated. We were unable to find many American surgeons interested in hibernation therapy, the technique of reducing body temperature to subnormal levels. Furthermore, few American psychiatrists were interested in the application of drug-induced sleep therapy. So, we were obliged to put chlorpromazine, this new potentiator, on the shelf along with SK&F #525, not because it did not work as a potentiator—French surgeons and psychiatrists successfully used it this way; but because American physicians, surgeons, and psychiatrists just were not interested in potentiators. At this point, some of our associates in the company expressed the wish that we in the R & D Division would give up our compulsive pursuit of potentiators. So, we put our entire research project on potentiators back on the shelf.

What did we have left? Were any other properties of chlorpromazine worthwhile? What useful properties did it have when used alone? Two nonpotentiating actions interested us, (1) its powerful antiemetic action and (2) its distinctive effect on behavior. Its antiemetic action, though first recognized by Madame Courvoisier, Rhone-Poulenc's pharmacologist, was not considered therapeutically important by the French. However, we considered this action a potentially use-

The Case of the Shattered Pill

(*Continued on page 518*)

DEVANEY PHOTO

BATH FRAGRANCE

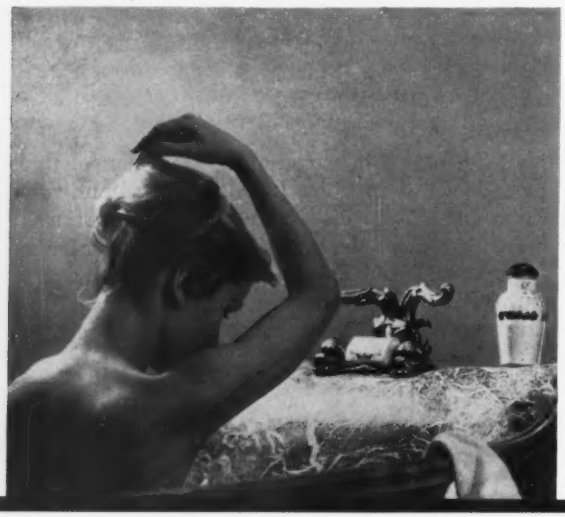
BY GUSTAV CARSCH TECHNICAL SERVICE DIRECTOR, ROURE - DUPONT, INC.

Bath preparations have had their ups and downs in cosmetic merchandising importance. We are now in a period of increasing interest in these products, coinciding with a stage of technical development that permits new approaches in formulations.

This discussion will touch upon bath preparations in the most inclusive way, but will begin with items that are actually put in the bath water. This group covers two distinct categories. One is the bath oils, the other, bubble bath products and water softeners. Many fragrance lines feature a floating bath oil strictly for fragrance, to provide a nice smelling tub and room, which is doubtless enjoyable and stimulating. However, other functional aspects are neglected, and cosmetic claims are relatively weak.

True, an oily film clings to the skin as one emerges from the bath, only to be toweled off immediately, leaving just a little protection or fragrance behind. The same oily film also produces a sticky bathtub ring, and treacherously slippery surfaces. Thus, this type of product is fine for fragrance but deficient in function.

COURTESY SHULTON, INC.



The water softeners and bubblers, our second category, prevent bathtub ring, some have a bit of cleansing action by themselves, and the bubbles are spectacular. This may be the reason that, with these products, fragrance has generally been relegated to secondary importance. Bubble bath preparations especially have been merchandised as novelties or children's items, using minimum amounts of inexpensive perfume oils. Presumably, a well-formulated preparation which functions as a water softener, leaves the tub ringless, and is generously perfumed would be a successful regular addition to quality fragrance lines.

Next come products for use immediately after the bath or—most important—after the shower. It is a reasonable assumption based on general observation that many persons have dry skin, not merely on the exposed surfaces of face and hands, but all over the body, often with special problems around elbows and knees, lower arms, and lower legs. There is no shortage of creams and lotions to ameliorate this condition. However, each product is perfumed individually and sometimes has a pronounced character of its own. It would seem not only logical, but highly desirable to merge function and fragrance in such preparations to a far greater extent than is now done. An effective body lotion with a fragrance to match the customer's

favorite perfume and cologne is likely to be preferred over any other product, which would have a different and possibly even a conflicting odor; it should have no trouble commanding a premium price.

Such a fragrant body lotion can be visualized as a fairly free-flowing emulsion of medium viscosity. It would spread easily and be neither greasy nor sticky. It should not "soap" when rubbed into skin, and it should contain basic ingredients or additives, singly or in combination, which can contribute to (1) moisturizing, (2) healing—anti-chapping effect, (3) softening—anti-keratinization effect, and (4) lubricating—replacement of skin oils. Its *p*H should be near neutral, that is, between six and eight, it would be distinctly, even richly perfumed, but not overwhelmingly so, and it would be nonirritating and nonsensitizing.

Some elaboration of the means to obtain the specified properties may be useful, even though it can be assumed that most cosmetic chemists have their own ideas and experience to guide them in creating the desired formulations.

Easy spreading can probably be achieved without any special effort, since it is a normal property of the type of emulsion called for. Creating a nongreasy preparation is also a simple matter, because the oil content of the formulation can and should be low.

However, making a lotion that is not sticky and does not soap is difficult, and requires delicate balancing. It is more accurate and realistic to speak of "minimum stickiness" and "minimum soaping."

Humectant and lubricating additives can easily contribute to some sticky feel. Waxy ingredients such as spermaceti, cetyl alcohol, or stearic acid, which serve to give body to the emulsion, have a tendency to soap. Silicones counteract this nicely, but the correct relative amount is important for best effect without general disturbance of the emulsion.

As far as optional additives are concerned, any suggestion is liable to be controversial, because definitive evidence of the performance of such additives is so hard to come by. The product under discussion, a "fragrance cosmetic," will probably not feature special ingredients. If claims are to be made, then there had better be substantial literature references or original work to prove the point.

The property of moisturizing may be the most controversial function of those listed. The additives for this could be simple humectants, such as glycerine or glycols.

For healing effect, allantoin is indicated—clinical work with this material has been reported. And for softening, vitamins or vitamin-related products may serve.

For a lubricating effect, which itself will, of course, contribute to softening and help to prevent chapping, one can turn to a variety of lanolin derivatives. Isopropyl myristate, isopropyl palmitate, and stearyl alcohol also may be considered. Whatever is chosen

COURTESY UHU PRODUCTS CORP.

must be of virtually odorless grade, and must be incorporated judiciously to avoid imparting any greasy feel to the lotion. One ingredient definitely not recommended in this connection is lanolin itself. There is just too much odor in even the best grades to permit its use in a fragrance lotion.

Little comment is needed regarding *p*H. It is merely common sense to stay near neutral with any cosmetic item that does not require a specific *p*H for its function.

Now, finally, the key factor, perfuming. A lotion distinctly, even richly perfumed requires a range between 1 and 2 per cent—and that means trouble. Not serious trouble, but not just any lotion formula will work or remain stable at such a rate of perfume incorporation. Fortunately many new emulsifiers of various types are now available to cope with the problem, which here differs from the routine, whereby a perfume compatible with the product is chosen. The difficulty is to make an emulsion carrier to suit the perfume compound, which, in accordance with the thinking expressed above, should match corresponding fragrance items in the form of perfumes and colognes. *(Continued on page 558)*

COURTESY ELIZABETH ARDEN

ITCHING

Part one. ITS NATURE AND CAUSES

BY BERNARD IDSON, Ph.D. TECHNICAL DIRECTOR, DOHME CHEMICALS

Pruritus, or better, itching, drives more patients to the doctor than any other skin condition. More effort is spent in attempting to alleviate itching than for any other dermatological management. Itching, while often a scourage to the patient, is just as often a perplexity to the physician. In fact, it has been observed that there must be some significance, rather than sheer coincidence, in the fact that the four letters i-t-c-h form the stem of so many words that connote unpleasantness—witch, snitch, twitch, bitch, and the like.

Itching may simply be defined as a sensation which excites the desire to scratch the affected part. "Tis better than riches to scratch when it itches," states an old proverb. Nothing will relieve an itch so promptly and with more personal satisfaction than a good scratch. This desire to scratch differentiates itch from pain. With pain there is the desire to withdraw. The need to scratch certainly makes the word "itch" infinitely more descriptive than the more staid term "pruritus." Primary symptoms of pruritus are those of itching, burning and tingling. Secondary manifestations, such as reddening, laceration, scaling, and secondary infection develop simply as a result of scratching, rubbing, or less frequently, the infection of bacteria.

The tendency to itch varies greatly in individuals. It is a common clinical experience to see certain patients fail to experience itching in association with dermatoses, which are otherwise uniformly pruritic in character. In contrast, some patients are abnormally sensitive to pruritogenic stimuli. Sulzberger[1] has used the term "itchish" to describe these individuals. Rothman[2] calls this "itching hyperexcitability," where the tormenting itching-scratching cycles develop.

In pathologically itching conditions, two mechanisms can be clearly separated. First, there is a short-lasting, spontaneous itching during the development of cutaneous lesions, such as in urticarial wheals and eczematiform vesicles. They itch spontaneously while irritating substances are being formed locally by the morbid process. This initial itching is of short duration, usually lasting only a few minutes, as, for instance, after an insect bite. It is probably due to direct chemical irritation of epidermal nerve endings. After the itching has subsided, an increased itching sensitivity to mechanical, thermal, and chemical stimulation persists for many hours, or even days, in the area around the lesions, regardless of whether the anatomical lesion has subsided, as in urticaria, or has not subsided, as in the case of eczema. If the spot of an old insect bite is rubbed, it often starts to itch again, although nothing can be seen on the skin. The skin "remembers" past experience because the sensory points in that spot have suffered partial damage, the repair of which requires several days.

The causes of itching are manifold. A patient seeking medical care may complain that "it itches all over" (generalized pruritus) or "just here" (localized pruritus). Local itching is more frequently found in the anal, vulval and scalp regions. Allergy in any of its forms may provoke itching, without any evident clinical signs. Itching is often divided into those cases in which there is no ascertainable cause (primary or essential pruritus), and those in which causes can be discovered (secondary pruritus). Obviously, the most effective therapy in secondary pruritus is to eliminate the causal factors.

Pain and itch are often confused, and almost seem to be indistinguishable, except, as noted, by the motor response. Both sensations can be elicited by physical and chemical stimuli, and several investigators[2, 3] have pointed to numerous factors that pain and itch have in common. Many stimuli to the skin can produce itch when the intensity is low, and pain when the intensity is high. It has been suggested that itch is, in fact, subthreshold pain. The sensation of tickle is subjectively indistinguishable from itch. The gross difference is that tickle prompts movement.

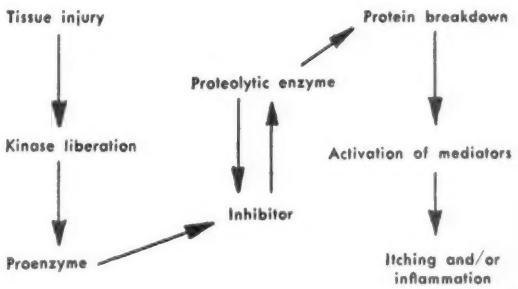
Anatomically, the chemical production of pain and of itch can be readily linked with a distribution of free nerve endings in the epidermis and at various levls in the dermis. Keele[4] postulates that the intra-epidermal nerve endings are concerned only with itch and the dermal endings concerned only with pain. The receptors for itch are believed to be situated on the filaments running between, but not into, the cells of the epidermis, penetrating as far as the stratum granulosum. These receptors can be stimulated by histamine and proteolytic enzymes, but not by other substances such as potassium or serotonin. When the epidermis is removed, itching can no longer be elicited because the appropriate receptors are gone. Since the occurrence of itching is related to the so-called pain spots on the skin, and since nerve fibers conveying itch run up the anterolateral tracts of the spinal cord,

it is assumed that itch fibers, though independent of pain fibers, pursue the same anatomical pathway. The only differences are at the very periphery, and presumably also in the central nervous system where the pathways end.

Until recently, it was thought that itching was mediated largely by histamine, which probably produces itching by acting on the epidermal receptors in the intact skin surrounding the exposed areas. Itching from histamine is always accompanied by a visible reaction. However, severe itching occurs commonly in clinically normal skin. This discrepancy led Shelley and Arthur[5] to investigate itching produced by cowhage or "itch powder." When rubbed into the skin, the powder produces marked itch. Extract of cowhage contains very little histamine, but does contain a proteolytic enzyme, which, when administered by intradermal injection, produces itching within 30 seconds. Insertion of a single cowhage spicule almost parallel to the skin surface produced itching within 15 to 30 seconds without reddening or hive formation. The discovery of one pruritogenic protease naturally raised the question whether other proteolytic enzymes could act similarly. It was then found that various proteolytic enzymes of the endopeptidase series produced itching on injection. Enzymes studied included that isolated from cowhage (mucunain), papain, bromelin, ficin, and fungal and bacterial proteinases. Effective animal proteinases were trypsin, chymotrypsin, and fibrinolysin (plasmin). It would appear that the proteases native to human tissue are the primary instigators of itch.

There is increasing evidence that inflammation is mediated by the breakdown of tissue protein.[6] The sequence of events in inflammation as illustrated below, has been shown to be equally applicable to itching.[7]

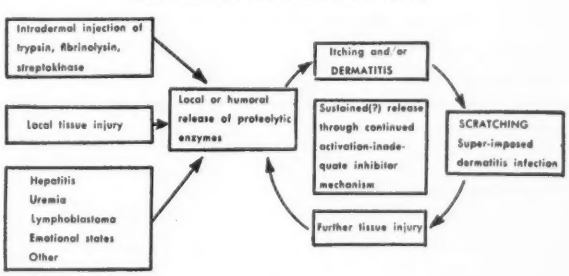
MECHANISM IN ITCHING AND INFLAMMATION[7]



While the inflammation concept[6] was based mainly on the fibrinolytic mechanism in the blood, it is now becoming increasingly evident that proteases, regardless of their origin, may have an essentially similar action on tissue protein. Following the initial tissue injury, various kinases are liberated. These include bacterial kinases, cytokinase, and serokinase. The kinases do not act on enzyme precursors but on a proactivator found in tissue. This in turn is converted to an activator that acts on the enzyme precursor to form the proteolytic enzyme. When the protein molecule is split by a protease, histamine, which has been bound to the tissue, is released and complex polypeptides are liberated. These substances may be the mediators of the end reaction of inflammation and/or itching.

Then tendency of itching to be self-perpetuating may be augmented by various secondary factors,[7] which are summarized below. It is probable that in-

OBSERVATIONS ON THE ITCH CYCLE[7]



creased proteolytic activity is present also in uremia, diabetes, lymphoblastoma, and emotional states. The question arises as to why some patients with these syndromes itch and others do not. It is probable that release of proteolytic enzymes is followed by variable patterns of enzyme reactivity in individual subjects. The development of prolonged itching in various parts of the body, following intradermal injection of relatively small amounts of a proteolytic enzyme, suggests that itching, once initiated, tends to perpetuate itself for variable lengths of time. In patients who develop itching there may be either a sustained re-

(*Continued on page 553*)

WHAT PRICE BEAUTY?

BY L. STAMBOVSKY Ph.G.

To the female, beauty is her most treasured asset, which if not possessed, is most desperately pursued. Without it, the fulfillment of her destiny—a mate and procreation, is retarded or remains forever unattained. Such denial is erosive, psychologically and physiologically. The sex urge and its ultimate objective, extension of the race, is deep-seated and is one of nature's most powerful driving forces, being secondary only to hunger and self-preservation. The female is instinctively aware that her social, psychological, and physiological well-being are dependent upon her ability to attract the male. This very aspect of nature is the basic motivation for our huge cosmetic industry, which arises in response to the prodigious effort expended by the female to acquire a maximum of attractiveness. To probe into the anatomy of beauty will reveal one of nature's most efficient plans whereby the female with superior physical qualifications is permitted to hand down the spark of life, or, at least, the function is assigned preferentially in the order of those most qualified.

The mechanism of selection is simple; there can be little or no physical beauty without health and, generally, the healthier the animal, the greater is the assurance of normal or outstanding offspring. The male possesses an instinctive or intuitive understanding of these principles of eugenics; therefore, the healthiest female, which is to say, the most attractive, will radiate the strongest appeal for the male.

Composition of Beauty

There are two distinct phases to the phenomenon called beauty—tangible and intangible. Among the former must be included an erect, well-proportioned body with good muscular tone and with sufficient but not excessive adipose tissue to create tangents and curvatures where indicated; a luxurious head of hair, vividly intense with natural color and without the tell-tale snow of dandruff—this is a high note in the Lorelei song; a smooth, clear, animate complexion without evidence of past dermatologic catastrophies is another component of charm; a competent dental arch filled with dense, properly spaced teeth free from caries is a basic constituent; alert, clear eyes, unspoiled by excessive red capillaries is another valuable asset; facial symmetry is of consequence, but countless women have been considered beautiful despite ordinary or imperfect features, providing a sufficiency of other mentioned attributes were present; good grooming, conduct, and personality are also, to some degree, influential in the structure of sex-appeal. Inversely, the male is disgusted or repelled by a skin marred by excessive oiliness, excessive dryness, witheheads, blackheads, enlarged pores, pimples, crow's feet, crepey throat, neoplastic excrescences such as warts, freckles, permanent reddening or other signs of chronic sunburn. In the hair, which is a skin appendage, the male enthusiasm is cooled by excessive oiliness or dryness, by dandruff and grey hair.

The second, or intangible, phase of feminine charm or appeal, is not perceptible by sight, sound, or touch, but is nontheless real and even more commanding than those characteristics which meet the eye. Of this provocative force, little can be said except that it is an inner glow—the sum total of optimum function of all body mechanisms, which radiates a magnetic attraction difficult to resist. These two forms of allure, the tangible and intangible, potentiate each other and comprise what is known as sex appeal.

The physical assets we have listed are, or should be, the birthright of every women, yet millions of females, young and old, spend millions of dollars on various preparations for acquiring or restoring a skin that is pleasing or at least tolerable to the eye. Most cosmetics are intended for application to the skin, since its abnormalities are the basis for the bulk of all beauty "problems." No one will question that nature intended the outside covering of the body, the skin, to be normal and at the same time attractive. This brings into the foreground the question as to why so many millions of females are forced to resort to corrective or restorative cosmetics. We shall offer proof that the answer resides in one word, nutrition.

Signs of Dermatological Deterioration

The signs and symptoms of dermatological deterioration, which fundamentally reflect physiological deterioration, are manifold, diverse, and unsightly. These pathologies encompass excessive dryness, excessive oiliness, chapping, whiteheads, blackheads, enlarged pores, acne, pimples, crow's feet, crepey throat, pendulous contours, warts and other growths, freckles of abnormal size and color, permanent reddening and other signs of chronic sunburn. Lack of

DEVANEY PHOTO

color, animation, and vitality must also be included in this category. In the hair, which is an appendage of the skin, signs of deviation from normal are excessive dryness and oiliness, lack of sheen and vitality, brittleness, dandruff and gray hair. Dandruff is so wide-spread in America that it is almost accepted as normal by both the laity and the medical profession. The incompatibility of dandruff with feminine charm needs no comment. Of deeper significance is gray hair or loss of hair pigment. This malady has been regarded as an inevitable accompaniment of old age. This opinion or theory is without any scientific support; it becomes totally untenable when equated with the extremely common occurrence of gray hair in females in their early twenties and thirties. Keen embarrassment and serious losses in social and professional opportunities are suffered by thousands of young women thus affected, even if only slightly. That gray hair is prima facie evidence of physiological disturbance or decline is beyond question, especially during the younger years, yet the medical profession exhibits a complacency towards this breakdown that is difficult to understand. During the summer months, varicose veins come into view—few physical distortions are more hideous. While this vascular impairment does not fall within the sphere of dermatology, it is nevertheless fatal to feminine appeal; fortunately, the middle and older age groups are mostly affected.

Cosmetic Patrons

The patrons of the cosmetic business may be divided into three more or less overlapping classifications: those who wish to enhance the virtues they already possess; those who seek to acquire artificially the components of beauty nature failed to provide; and those who strive to conceal, mitigate, rectify, or cure dermatological deterioration. The latter segment exceeds by far the combined former two in the generation of business. The dimensions of the various skin disorders involved in this discussion are partially illuminated by Table 1.

TABLE 1
Common Skin Problems[1]

	Percentage
Dryness	38
Oiliness	17
Flaking	17
Chapping	17
Blackheads	26
Whiteheads	1
Lines	23
Freckles	11
Large pores	26
Pimples and blemishes	21

This survey leaves much to be desired, since only 1765 subjects were interviewed. The data is reproduced only because of its agreement with another national assessment of the status of the female integument, which is given in Table 2 (page 565).

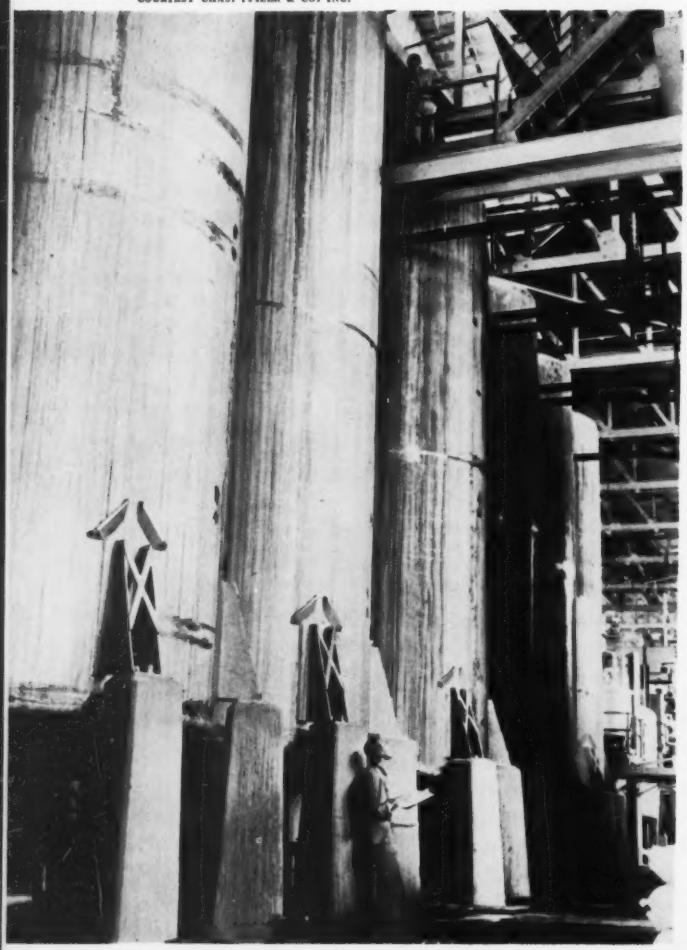
We may accept with considerable confidence the dimensions of cosmetic difficulties in America suggested by all these expenditures for products with which to treat them, since reasonable accuracy is assured by the fact that the female would not spend such huge sums of money unless there was a press-

(*Continued on page 565*)

BOUNTIFUL BACTERIA

BY ARTHUR H. BRYAN, D.V.M.
ASSOCIATE PROFESSOR, BACTERIOLOGY AND BIOLOGY,
JACKSONVILLE UNIVERSITY, JACKSONVILLE, FLA.

COURTESY CHAS. PFIZER & CO. INC.



Among man's most valuable allies and microbial best friends are the bacteria—there are many thousands of various types and strains and only comparatively few are pathogenic for man, animal, or plants. Their habitat is virtually world-wide for they exist on land and sea, and in the air, and necessarily so, as they are indispensable to all other forms of marine life.*

In the science of agronomy, that is, the study of the soil, the microbial flora of bacteria, yeast, molds, and other fungi are responsible for the decomposition and reduction of complex dead plant and animal matter to simple soluble salts such as the nitrates, nitrites, urea, crystals, urates (salts of uric acid), phosphates, chlorides. These salts are ultimately returned to the soil, as fertilizer in composte, or the assorted manures so necessary to the nutritional growth and life cycle of plants.

Bacteria are present in the air, too, existing mainly as harmless saprophytes. However, man and animals may contaminate it by coughing, sneezing, or epectorating pathogenic bacteria and viruses as a fine spray, which then become airborne.

The sea water, particularly in fertile areas such as the continental shelves and the Gulf stream, are teaming with plant and animal necton and plankton and may harbor literally hundreds or thousands of useful bacteria per drop of water. First, there are heterotropic bacteria, which gain their energy from the oxidation of organic compounds, and second, there are autotropic bacteria, which form carbohydrates and proteins from CO_2 and H_2O, and inorganic salts. These lowly but essential microorganisms play a vital role in helping to keep the seven seas, inland waterways, and bays relatively free from putrefactive and decay products. They do so by aerobic decomposition of the dead marine organic matter left over by oceanic scavengers such as crabs and other crustaceans. Thus, unless contaminated by the muddy effluents of rivers, sea water is clean, clear, and comparatively transparent, because in the marine life cycle this dead matter ends up as insoluble detritus or useful inorganic salts. Marine algae such as diatoms, sea and rock, weeds, kelps and sargassum weeds, along with some bacteria, contain chlorophyll. These plants in photosynthesis manufacture starches from CO_2 and H_2O and, with nitrate salts, the complex proteins and protein molecules. The by-product, oxygen, which is essential in aeration of the waters and vital to all marine life, is released.

The Role of Bacteria in Medicine

Useful bacteria are being raised for their therapeutic benefit in the intestinal tract. *Lactobacillus bulgaricus* and *acidophilus*, which are cultured in milk and yogurt, when imbibed regularly, tend to predominate among the intestinal flora, with a fa-

*Arthur H. and Charles G. Bryan, *Bacteriology: Principles and Practice* (5th ed.; New York, N. Y.: Barnes & Noble, Inc., 1956).

vorable tendency to lower incidence of gastrointestinal diseases. Buttermilk, heavily laden with the *Bacillus lactici acidi*, is also used in the bacteriotherapy and hygiene of the alimentary canal. Some of the antibiotics used in the drug industry, such as bacitracin, polymyxin, subtilin, and tyrothricin, are of bacterial origin. Even the pathogenic microorganisms are attenuated and cultivated, to control communicable disease, through the preparation of bacterial and viral vaccines, toxoids, antitoxins, antisera, and the like, and used in test agents such as tuberculin, leprolin, and the Schick test for diphtheria susceptibility.

Industrial Enzymes

Enzymes are colloidal agents produced by living cells, which can induce chemical changes in other substances. They act literally as organic catalysts. In science and technology, enzymes can accelerate the speed of chemical reactions without being themselves changed during the process. Coincidentally significant is the fact that bacteria produce many essential enzymes vital to human, plant, and animal metabolism.

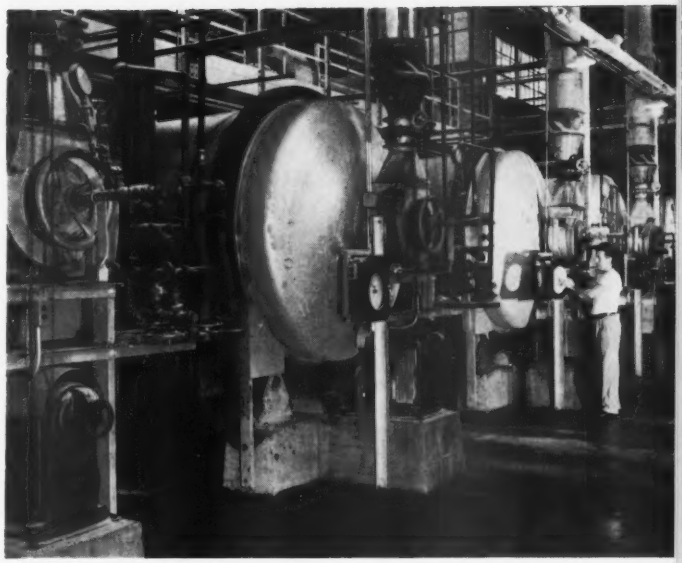
Some enzymes require coenzymes, their associative and selective activators, which are dialyzable and of smaller molecular size. Bacterial enzymes are responsible for countless applications in practical industrial utilization. There are proteolytic, phosphorulating, lipolytic, glycolytic, oxidative, adaptive, deaminating, fermentative, decarboxylating, coagulative, and constitutive enzymes, all variously produced by different types and strains in the course of bacterial cell activity. As an example, enzyme production may be enhanced by the *Bacillus mesentericus*, which is used in the commercial production of amylase and protease. The *Bacillus macerans* is another amylase-former.

Bacteria in the Chemical Industry

Lactic, acetic, butyric, formic, and proprionic acids are produced by bacterial action, while others, on the contrary, may be alkali-formers. Gases generated during the process include H, N, CO_2, H_2S, ammonia, and methane. Furthermore, some bacteria of the nitrifying species convert ammonia to nitrites and nitrates; others, conversely, reduce nitrates to ammonia. In decay in the presence of oxygen or aerobic decomposition, amino acids are formed which may be further broken down to form indol, H_2S, CO_2, H_2O, and NH_3. In anaerobic bacterial putrefaction, which is decomposition in the absence of oxygen, malodorous H_2S, indol, skatol, mercaptans, putrescine, and muscarine are produced.

Vitamin Production

The fermentation and isolation of vitamins is important in the up and coming foods supplement industry. The process is dependent on complex physiological activities which result in the decomposition



COURTESY WALLERSTEIN COMPANY INC.

of organic compounds to citric acid, propionic and gluconic acids, glycerine, alcohols, and acetone, with the coincident release of various vitamins.

Bacteriological Warfare

Unexpected changes in bacterial genes may often occur during reproduction cultivation of bacteria. Millions of possible gene combinations may result in unpredictable mutations, resulting in alterations from the parent original strains. Hence, new variants of any specific bacteria are a constant possibility. In future bacteriological warfare, it would take time to develop defensive vaccines against virulent, mutant strains of pathogenic bacteria and viruses. Enemy-provoked epidemics and plagues would therefore constitute a menace to public health calling for a prompt sanitary solution involving isolation, evacuation, vaccination, and disinfection as prophylactic measures.

Industrial Fermentations

In vinegar-making, when an alcoholic liquid is exposed to air for a time, a surface film appears. Then, when the liquid becomes sour, due to oxidation of the alcohol to acetic acid by members of the genus *Acetobacter*, the product is vinegar.

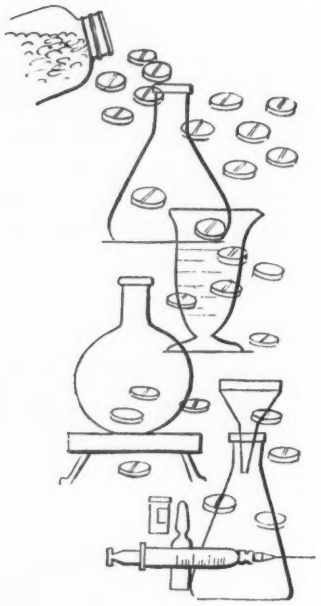
Sauerkraut-making uitilizes the lactobacillus group of bacteria responsible for the fermentative process occurring in shredded cabbage leaves to form lactic acid. The acid so formed prevents putrefaction and decay. Other organisms produce organic acids, alcohol, and carbon dioxide.

Other fermentative processes involve the bacterial hydrolysis and fermentation of pectin, which, with cellulose hemicellulose, comprise the polysaccharide framework of plants. The hydrolysis and fermentations are accomplished chiefly by *Clostridium butyricum* or *Clostridium felsineum*, the main products

(*Continued on page 557*)

DRUG PROFITS

BY JOHN T. CONNOR PRESIDENT, MERK & CO., INC.



The drug industry is currently going through its first major public accounting at the request of a well-known Senate Committee. Properly conducted, such an accounting not only can serve the national interest, it can be useful to the industry involved. It can force the industry to go through a searching self-examination, which is normally a helpful occupation. It can also force it into a program of information and education. It does not hurt to be reminded of the strength and validity of the proposition that a successful business can be carried on in our society only with the public's understanding and consent.

The drug industry's accounting is probably overdue. If we had appeared under the kleig lights a number of times before, we probably would not have won so many unfortunate headlines this time. The American people's lack of familiarity with our business made it possible for them to believe the dramatic but unsubstantiated charges which appeared in the headlines.

In case you have forgotten it, let me remind you of the most spectacular of these headlines. In various forms it was plastered across the front page of nearly every daily newspaper in the United States within a few hours after the hearings opened. It is now engraved in the public mind. This is how one of the country's most conservative newspapers phrased it: CHARGE DRUG PRICE HIKED OVER 7,000 PER CENT

You must have wondered from what kind of mythical business this fanciful figure had been extracted. I can assure you, however, that your reaction was not typical. The newspaper correspondents and headline writers reported it with a straight face and most of our fellow citizens apparently believed it.

Where did it come from? The Committee staff had simply compared the cost of the raw material in a Schering drug called Progynon with the wholesale price at which the finished product was sold to the druggist. They called the difference "a markup of 7,079 per cent."

This is about as spectacular a piece of foolishness as has ever come out of a Senate investigation and landed on the nation's front pages. It is like comparing the cost of the raw materials in an Atlas missile with what the Department of Defense has to pay for the finished weapon, and then calling the difference a markup.

William B. Graham, president of Baxter Laboratories, subsequently said that if Senator Kefauver is looking for a really spectacular figure, he will be glad to supply him with one out of his own company. Baxter Laboratories, he explained, has a product that will produce a so-called markup of over half a million per cent. The raw material costs his company eight-thousandths of a cent and the wholesale price of the finished product is 54 cents—a markup of 675,000 per cent.

Mr. Graham then analyzed the true cost of his product by adding all the items omitted by the Senate Committe.—manufacturing, delivery, selling, general and administrative, research and development and miscellaneous costs, plus taxes. In the real world of Baxter Laboratories, the so-called markup of 675,000 per cent finally ends up as a net profit of a mere 7.1 per cent. The product is sterile distilled water.

I am not maintaining that the ethical pharmaceutical industry is not profitable. It is. And it must be, if we are to fulfill our responsibilities to our stockholders and our employees as well as to the public. If we gave our products away free, or sold them without profit, we wouldn't have stockholders or employees to worry about for long, because we wouldn't have any. Nor would we have satisfied customers, because we'd be out of business. If growth industries like ours are slowed down, who will pay the increasing federal taxes needed to support the medical research programs of the National Institutes of Health and pay for the other rising expenses of the

*Presented at the San Francisco Society of Security Analysts, March 1960.

Federal Government?

To be specific, Merck's net profit for the past ten years has averaged less than 11 per cent, after taxes. Eleven per cent, it seems to me, is a reasonable profit to pay for the high rate of discovery the American people are demanding from this industry. Our profits could probably be reduced if the public were willing to accept a slower rate of progress. But this would turn out to be penny-wise and pound-foolish. Most new drugs pay for themselves many times over. The cortical steroids are a good example. By restoring a more normal life to more than three million people who would otherwise be crippled by rheumatoid arthritis, these drugs are adding over a billion dollars a year to the U. S. economy. And these savings are minor compared with the pain and suffering the steroids have averted.

So much for the headline charge of profiteering. The best protection the public has against profiteering is not headline charges, but competition. It is not surprising, therefore, that the hearings produced a headline on this subject. It was stimulated by the Senator's statement late in February that the drug industry showed the highest degree of concentration he had ever seen in any industry. That statement, I submit, is errant nonsense.

On what did he base this startling statement? He based it on a Committee chart that showed that the manufacture of certain products was concentrated in the hands of very few companies. Some drugs, the chart showed, had only one producer. Typical of the chart was what it showed regarding the concentration of antibiotic production. Six of the 14 antibiotics listed are produced by only one company each.

Despite the following day's headlines, the Senator had proved exactly nothing. Most of the products he used as examples of concentrated production are intensely competitive with one another. It is as if he had tried to prove high concentration, or lack of competition, in the automobile industry a year or so ago by showing that George Romney's company was the only one producing compact cars in the United States.

One of the best ways to measure the extent of competition in an industry, it seems to me, is to find out how that industry's sales are divided. Is the market dominated by two or three giants or is it characterized by a vigorous rivalry for position on the part of a number of fairly equal competitors? All the studies I have been able to find of what the economists call the concentration ratio, or the degree of market domination by a few firms, put the pharmaceutical industry near the bottom, not near the top, of the list.

A recent study of the U. S. human ethical drug market shows that the ten leading firms in 1959 accounted for only 53 per cent of the industry's identifiable sales at the retail and hospital pharmacy level. The study also showed that this percentage for the first ten has been falling, not rising, in recent years.

I thought it might be interesting to you to list these companies in the order of their importance in the 1959 U. S. ethical drug market. At the head of the parade is Eli Lilly. Lilly doesn't have 50, or 25, or even 10 per cent of the market. It has less than 8 per cent. Close behind in second place is Upjohn. SK&F is third. Lederle and Parke, Davis are fighting for fourth. Wyeth and Merck Sharp & Dohme are racing for sixth place with less than 5.5 per cent each. Then follow Squibb, Abbott, and Pfizer.

The order of these companies is constantly moving. Merck Sharp & Dohme, for instance, moved up in two years from ninth place to a tie for sixth. Other companies have lost ground or otherwise changed position.

These figures tell the story of competition in the drug industry. They show a close, tough race. The leader has well under 10 per cent of the market. Further, its share dropped somewhat in the last year to 7.5 per cent. The margin that separates most of the first ten companies is so narrow that their relative position is likely to change again before the year is out.

Will this trend toward greater and greater competition extend out into the future? I think the very success of our industry will insure that it does. In our economy, success breeds competition. Every month, more capital, more enterprises, and more research laboratories are enlisting in this industry's competitive war against disease. Survival in this competition is governed by a rule that is as ruthless as our success is inviting. The rule is this: Make new and substantial contributions to American medicine year after year, or get out, or at least lose your competitive standing.

How well is this rule working? A single figure will suffice as an answer, because it demonstrates rather dramatically the unusual rate of discovery and obsolescence we are generating in our research laboratories. A recent check shows that more than 80 per cent of the prescriptions written during the third quarter of 1959 for Merck products could not have been written ten years ago; the drugs had not yet been born.

I think the public can rest assured that competi-

(*Continued on page 563*)

WHIRLING-ROTOR GRANULATION

BY R. O. BUCHHOLTZ MANAGER OF PROCESSING, WARNER-CHILCOTT LABORATORIES

An automated granulating-and-drying system used in the production of Gelusil antacid tablets at the Morris Plains, N. J., plant of Warner-Chilcott Laboratories, a division of Warner-Lambert Pharmaceutical Company, has recently been modified and made more efficient by the installation of two "Tornado" Mills manufactured by the F. J. Stokes Corporation.

The new milling facilities have significantly improved the quality of the output from these preparatory operations and have also increased its volume.

The Tornado Mill is a new type of vertical-flow granulating and mixing machine with a whirling-blade rotor that throws the material outward at high velocity against a 360-degree cylindrical mesh screen. In the preparation of Gelusil, the two mills provide much better moisture-dispersing action (in the wet-granulating stage) as well as particle-size reduction of superior uniformity (in both wet and dry granu-

A mobile Stokes Tornado Mill mounted on casters, which plugs into a wall-outlet and can be moved from department to department for any variety of uses. Here, it is blending certified color into a dusting powder, which will then be used for pan-coating tablets. Above right,

a close-up of the wet granulating operation. Tub of wet mixture is hoisted by a mobile gantry and discharged into hopper of a motor-driven rotary feeder, which feeds it into the first Tornado Mill. Mill is enclosed totally in steel. After granulation, mix goes up in conveyor.

lating) than the older type of mill, which they replaced.

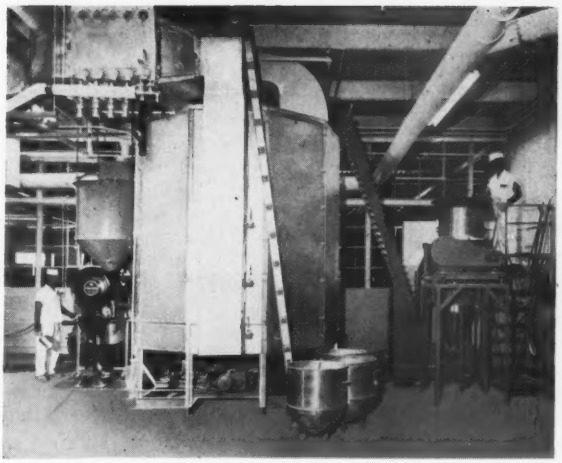
The effect of this improvement in performance has been to double the drying capacity of the existing rotary-tray dryer, which means that at least $35,000 of capital investment has been saved that would otherwise have been required for additional drying equipment. In addition, the Stokes mills have reduced power consumption and have practically eliminated screen replacement, which adds still more to the annual savings.

Sequence of Operations

The two Stokes Tornado Mills have been incorporated into a very efficient continuous granulating-and-drying system developed by Warner-Chilcott. In this, the material flows automatically from the wet-granulating stage to the drying oven to the dry-granulating stage, without re-handling.

The first of the two mills is used for wet-granulating, serving both to distribute the moisture uniformly throughout the batch of material as it comes from the mixer and to reduce the size of the larger clumps of the wet mixture. The extremely thorough dispersing action of the mill makes it certain that all of the powdered material in the batch will be wetted with the granulating syrup and go into granular form. This thorough wetting action also serves a second function, namely, to bring out certain desirable properties of the combination of aluminum hydroxide and magnesium trisilicate that are only produced when they are thoroughly and intimately combined. These properties produce more pleasant chewing properties in the final tablet.

From the first mill, the wet granulation is carried by a bucket-type elevating conveyor to the top of the drying oven. The uniform-sized particles of wet granulation produced by the Tornado Mill have a more consistent drying pattern than would a batch of irregular size. Consequently, the efficiency of the oven is increased and its drying capacity effectively doubled.

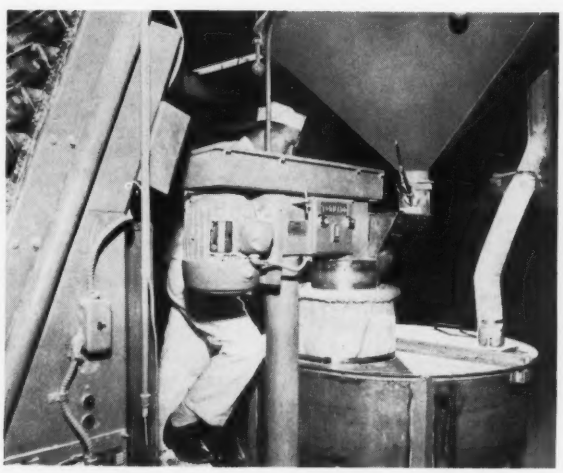


An over-all view of the automated granulating-and-drying system. Wet granulation of the mixture takes place at right; the uniform-sized clumps are then conveyed to rotary-tray dryer in center; the dry mix then moves to hopper at left and flows into the dry granulation mill.

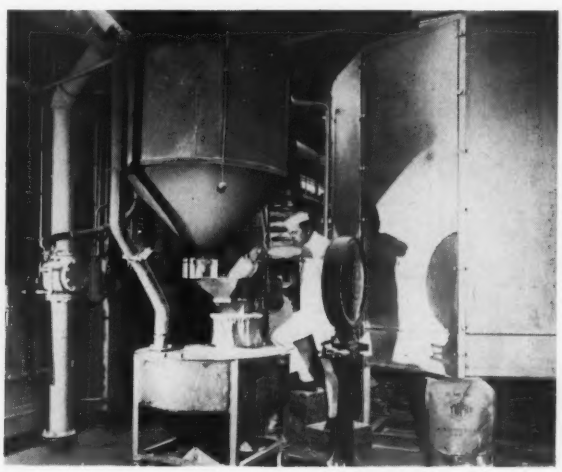
The dried material that emerges from the bottom of the dryer is then picked up by another elevating conveyor and carried to the top of a hopper which feeds the second Tornado Mill. This second mill dry-granulates the material to its final particle size. Here again, the uniformity of results obtained by the Tornado Mill is significant. The predominant portion of the dry-granulation is of 20-mesh particles, with a minimum of fines and a minimum also of coarser particles (maximum size is 12-mesh).

The dry Gelusil material then goes to the blender, where it is mixed with peppermint-flavored oil, and

(*Continued on page 562*)



The dry granulation Tornado Mill, to which the mix is carried after leaving the rotary-tray dryer, drying as it descends. A cloth sleeve surrounds the perforated screen, to catch any fine particles. Above right, a lubricant is being added to the Gelusil during the dry granulating operation. This Tornado Mill, second of the two in the Warner-Chilcott operation, reduces the particles to final uniform size. The entire operation runs continuously. The mill has no rubbing action; it whirls the material against the screen by centrifugal force.



THE THIOGLYCOLATE STORY

BY MICHAEL AND BETTIE STANTON STANTON SALES CO.

The Raw Material

Early methods of permanent waving by chemical means started with the sulfites and alkalis, together with heat. Cold permanent waving, without the application of any heat, began with ammonium sulfide which, evil smelling though it was, gave satisfactory waves. Its use was banned, however, in 1941 after it had been blamed for the death of a woman customer in Georgia. Thioglycolic acid, which was being used experimentally at this time, was introduced as ammonium thioglycolate into beauty shops by a few manufacturers. The beauty salon was a fertile field for its successful development since, economically, this business was at a low ebb. The average price for a permanent wave by the heat method was then about $2.00, although beauty salon equipment included lotions, aluminum foil, cotton felt pads, rods, and, frequently, machines as well.

During the war years, some of these materials became scarce or even unobtainable. As a result, thioglycolate salts became the materials of choice, partly because wartime priorities did not completely affect availability, and because they were accepted as safe, effective hair waving agents. There were successful results on delicate and fine hair that previously had become frizzled by heat waving. No expensive machinery or equipment was necessary for the application of the cold wave lotion, and the process was fairly direct and simple; this led logically, in time, to its adoption for home use.

Eventually, the most commonly used salt was ammonium thioglycolate, although some lotions contained monoethanolamine or sodium salts. The most commonly used formulations were: 6½ per cent thioglycolic acid (as ammonium thioglycolate) for normal hair; 5½ per cent for bleached and dyed hair; 4½ for home use—all at *p*H 9.5

During the early 1940's, little art or cosmetics was practiced in the formulation of cold wave lotions. Perfumes, opacifiers, and wetting agents came along somewhat later, and, in recent years, color, appearance, and perfume odor, as well as mechanical applicators, became strong selling points in the merchandising of the product.

The Thioglycolate Manufacturer

In the early years of the cold wave, literally dozens

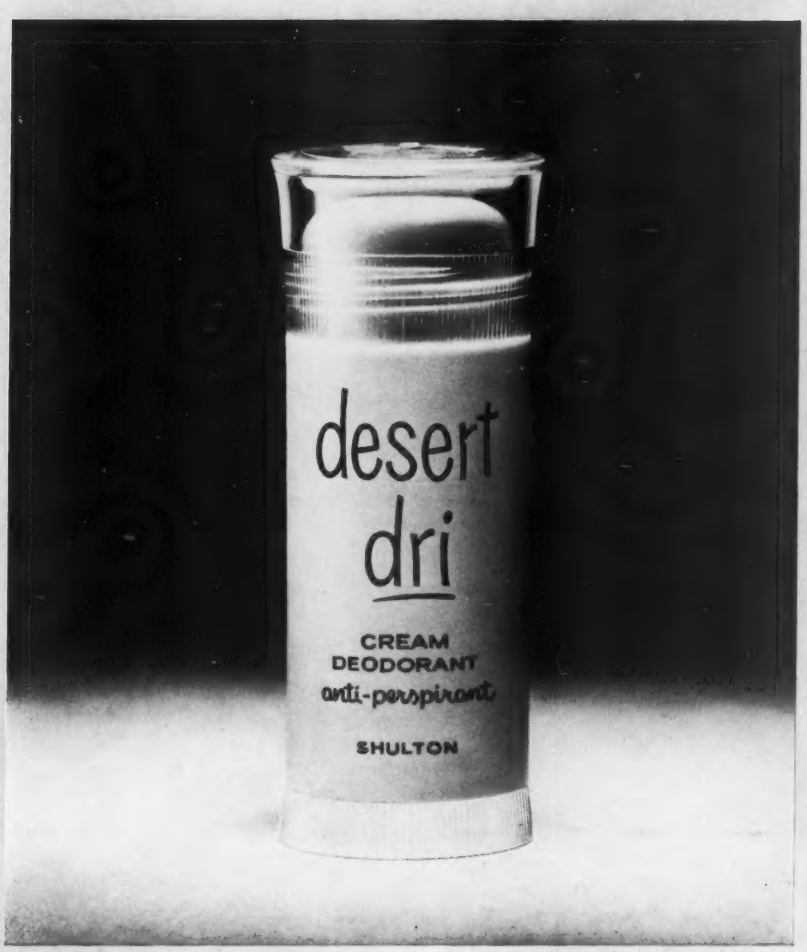
COURTESY HELENA RUBINSTEIN

of small chemical manufacturers attempted to produce thioglycolates. They were attracted by the lucrative possibilities of this new chemical specialty with the big future, but technical difficulties as well as high production costs and rigid specifications finally narrowed the field to a few surviving companies. Early production difficulties encompassed fume disposal problems, corrosion of equipment, sensitivity of the product to metal contamination, and the employment of inflammable and sometimes explosive solvents.

Some of the earliest thioglycolate products were dark amber in color, highly malodorous, and impure, but the idea of the cold permanent wave was taking hold with the public. The thioglycolate manufacturer worked closely with his customers and The Toilet Goods Association to determine and correct flaws and imperfections in the product. Eventually, The Toilet Goods Association published standardized specifications which grew out of this cooperation. As a result of these improvements, the color is now water-white, the odor considerably improved, and the material lends itself far better to perfuming with a new line of perfume compounds. The modern thioglycolate plant is a model of safety, cleanliness, and efficiency. Production costs have been reduced steadily as volume and yield have increased on a product which is essentially reagent grade. Naturally, this has always been reflected in the selling price, which has continued to drop. The thioglycolate manufacturer has acquitted

(Continued on page 554)

Packaging and Selling



Desert Dri, new cream deodorant by Shulton,
features an exclusive automatic applicator, combining the benefits of roll-on and a cream deodorant. A twist of the base releases the cream at the top, which can then be rubbed into the skin with the applicator.
The entire container is manufactured by Shulton; silk screening is by Permanent Label, and the card to which each unit is attached is manufactured by the National Folding Box Company.

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Task-Designed Crown aerosol cans contain the help for many a minor cut, scratch and scrape! And a whole new market arrived, thanks to aerosol cans that have been specially Task-Designed by Crown to package a wide variety of products. Aerosol-packed spray bandage is just one of hundreds of new products that gain consumer interest from Crown's pioneering, skill, wide experience and Task-Designing in this new field. May we have the opportunity to provide you with more details?

CROWN

for cans · crowns · closures · machinery

CROWN CORK & SEAL CO., INC., 9300 Ashton Rd., Philadelphia 36, Pa.

Caryl Richards' Aerowave, aluminum aerosol set for beauty salons containing cold waving lotion and instant neutralizer in seamless cans.

COLD-WAVE AEROSOL Packaged in Aluminum

Two of the most important recent developments in the $15,000,000,000 packaging field are undoubtedly the use of aerosols and aluminum. The aerosol propellant in conjunction with the aluminum container is now finding more and more uses, particularly in the medical, pharmaceutical, cosmetic, and chemical specialties areas.

The last aerosol production estimates from the Chemical Specialties Manufacturers Association, admittedly incomplete since many smaller companies do not report, show that six- to 12-ounce metal containers, since 1951—the first year of the industry survey, have increased in volume four times, to an annual rate of slightly over 100,000,000 units and metal aerosols of six ounces and smaller have increased 20 times, to an annual volume of approximately 160,000,000 units, or about 47 per cent of the total market. The Association's surveys do not differentiate between types of metals.

Growth of the small, metal aerosol can be attributed to four major types of products: shaving lather in metal aerosols had a reported annual volume of 13,500,000 units in 1952, is now at about 26,400,000 units; hair sprays have had a spectacular rise from 6,900,000 units in 1953 to 53,000,000; room deodorants were reported at 3,700,000 in 1951, now at 36,800,000; lastly, drug and pharmaceutical products have risen from a volume of 650,000 in 1953 to 5,600,000 units.

In the hair product field, which is already enjoying the largest volume in the small aerosols, Caryl Richards has just begun national marketing to about 100,000 beauty salons of a twin aluminum aerosol set containing cold waving lotion and instant neutralizer. Richards has already ordered over 1,000,000 units, and expects to reach an annual volume of 5,000,000 shortly. This new product incorporates a unique semi-fluorinated hydrocarbon propellant and a waving formula that cuts down objectionable odor and volatility by eliminating ammonia. The lotion and neutralizer, tradenamed "Aerowave," are packaged by Aerosol Techniques, Inc., in containers especially designed by the Peerless Tube Company. The 3.75-ounce containers are of extruded, one-piece, seamless construction, to insure against leakage. The Peerless-patented beaded neck makes the lip curl inward, to assure tight valve cup fit. The container in-

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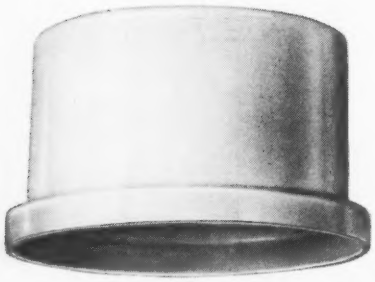

TOPS FOR CAPS

. . . SUPER DYLAN® high-density polyethylene

These aerosol can caps for two well-known products are molded by Gilbert Plastics from SUPER DYLAN high-density polyethylene. This tough, strong plastic is durable, will not chip or dent. The unique cap design protects the spray nozzle and makes the cans easy to stack, saving valuable counter display space.

SUPER DYLAN is dimensionally stable, light in weight, rustproof, and chemically inert. It has a smooth, glossy finish and can be molded in any color desired. Its ease of molding makes it possible to create caps for any size or shape of can.

SUPER DYLAN is "tops" as a packaging material. It can be molded into bottles and jars for liquids and semi-solids—in colorful, decorative and utilitarian closures for cosmetics and pharmaceuticals—or extruded as boilable, freezable SUPER DYLAN film for food packaging. For more information, write to Koppers Company, Inc., Plastics Division, Dept. DCI-4, Pittsburgh 19, Pennsylvania. Offices in Principal Cities, In Canada: Dominion Anilines and Chemicals Ltd., Toronto, Ontario.

KOPPERS PLASTICS

KOPPERS

Molder: Gilbert Plastics, Inc., Kenilworth, N.J.

Packaging and Selling

There seems hardly any question that the retail trade servicing this industry is undergoing changes that will substantially affect certain manufacturers, as well as certain aspects of the conglomerated retail pattern of distribution for health and beauty products.

This, of course, does not apply to ethical prescription products, but it does apply to that broad field of packaged branded products, many of them simply utilities sold over the retail counter, which are usually supported by national advertising. Since these influences are more apparent in cosmetic and toilet articles sales than in proprietary medicines, let's first take a look at the situation as it seems to be developing in cosmetic distribution.

The variety store entered cosmetic distribution in the early Thirties, at the beginning of the great depression. This retail move was immediately popular with the American public. For a while many of the big toiletries manufacturers with advertised brands basically distributed by drugstores, hesitated to enter the variety store field because of fear of jeopardizing their established distribution position with the drugstore.

As it became clear that the variety store was firmly entrenching itself in a certain section of cosmetic distribution, that is, the mass distribution of low-priced cosmetics and toiletries, the big manufacturers with their national brands one by one took the plunge and entered the variety store field.

For a while some of these manufacturers operated under the fiction, largely displayed for the benefit of any of their disgruntled drugstore customers, that the ten-cent package was merely a sampling operation which would, in the long run, prove of great benefit to their fine old customers, the druggists.

This sort of boloney was more or less accepted because there was nothing else the druggist could do. As it turned out, the expanding American economy took care of sales in this new field of distribution, aided by the fact that many American women felt that the ten-cent size enabled them for the first time to enjoy the regular use of cosmetic products.

The variety stores flourished in cosmetic distribution up until five or six years ago when they entered a period of substantially declining sales for cosmetics. This may have been due to the booming prosperity of the country and the universal trading up of the American people, or to the heavy inroads of house-to-house selling and super-markets, or to other obscure factors. Nevertheless the record is clear: cosmetic sales did decline substantially in variety stores, and manufacturers who were primarily basing their distribution on the variety store suffered substantially. One leading manufacturer, Lady Ester, if we remember correctly, commented in an annual statement a few years ago that the declining sales for that particular year could be accredited solely to the loss in sales by that company's primary distribution, that is, the variety store.

It is apparent that the leading retailers in this field, notably Woolworth's, have solved this problem—whatever it is—and are regaining a dominant position in the mass distribution of cosmetics and toiletries. The increased sales by variety stores during the last few years have been noticeable, and, as anyone can see by strolling through the cosmetic department of one of these newer stores, there is an alert bustle of actively conducted sales in a beautifully arranged department.

The department store also had its share of troublesome times in cosmetic distribution; during a period of four or five years when many of the so-called wise men of the industry, plus other deep thinkers in marketing and merchandising, prophesied that the department store was in a period of declining importance in American retailing.

Nobody could have been more wrong, because the department store has regained its dominant position in most communities, and it is a fact today that—particularly in the field of creative selling, in style, fashion, and glamor—the department store is again leading all the rest as the dominant, outstanding retailer in its community.

This position has been enormously fortified by the great success of suburban and branch department stores, a dynamic development which is still in progress.

So far as cosmetic distribution goes, the department store has again gained the dominant position in style, fashion, and glamor. With the execption of a limited group of retail drugstores, only the department store today offers skilled, intelligent, informed selling of perfumes and cosmetics.

This creative selling in the department store, plus the environment of style or fashion or glamor it gives to a cosmetic department, has a profound influence on the sales of all cosmetics in every price classification, and on all other retailers.

It would not be unreasonable to say that this creative selling and educational force in the department store is just as essential and just as effective in selling perfumes and cosmetics as is the sum total of all national advertising.

Retail drugstores have not increased numerically over the last ten years. This static position has con-

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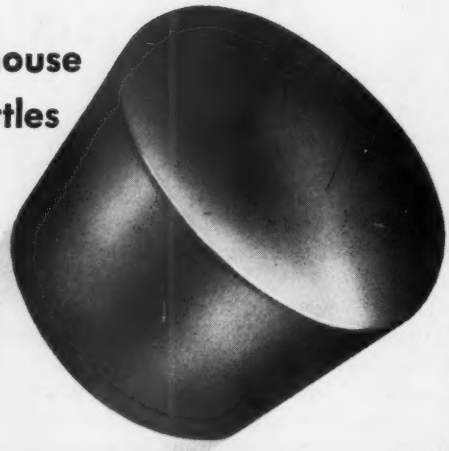

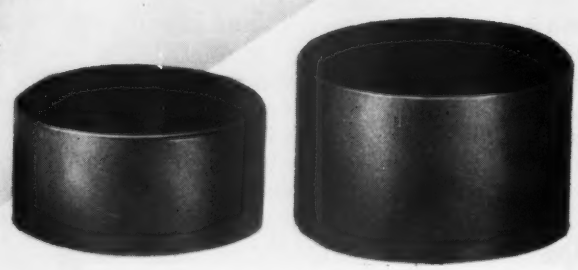

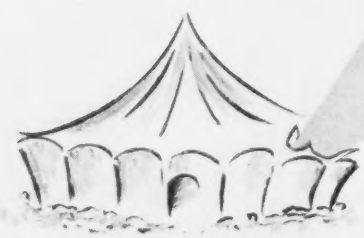

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tinued despite an enormous increase in the sale of ethical medicines brought about through dynamic research. The druggist should be, and usually is, relatively more prosperous today than he was ten years ago. In the sale of proprietary medicines, he has undoubtedly held his position, except for the challenge of the supermarket in certain household proprietaries.

In cosmetics, toilet preparations, and perfumes, it is increasingly clear that the druggist is not holding his position, regardless of all the optimistic speeches made at retail drug conventions. The true state of affairs seems to be that a limited number of drugstores, that is, from 4,000 to 5,000, who consider their cosmetic departments important enough to warrant a full-time trained salesgirl, are doing as well as ever, which means that they hold an important part in franchise or selected cosmetic distribution. Another limited group of drugstores, perhaps between 3,000 and 5,000, have the right store environment and atmosphere, adequate floor space, and other considerations, which give a druggist a position in cosmetic distribution. These stores, too, are more than holding their own, but the sad fact is that many others, the smaller fringe stores, the unclean stores, the cluttered and jumbled stores, are losing out drastically to the vigorous department in the grocery supermarket.

It is rather a pity that so many independent druggists, instead of entering more vigorously into creative selling, thus opening up one of their many fields of specialization of which cosmetics is an outstanding opportunity, should be devoting so much of their time to a heavy barrage of propaganda for monopolistic privileged protection. This means particularly the leadership the retail druggist is taking for fair trade legislation, and the almost universal clamor to retain a monopolistic position in the distribution of certain health products that have become practically family staples.

If history in marketing means anything, this is not necessary to the successful survival of the drugstore as an essential part of the distribution of such products as cosmetics and staple proprietaries.

The drug chain has had nowhere near the vigorous expansion that has opened up for the parallel chains of the food industry. Many things, of course, are fermenting in the drug chains, such as the trend to self-service, a broad movement to shopping centers and, in some cases, associations with food supermarkets.

So far as the cosmetic branch of this industry goes, I can see very little change in the status of the chain store of today as compared with several years ago.

The truly explosive retail growth of cosmetic and toilet preparations, together with certain basic health needs, has taken place, as everyone knows, in the grocery supermarket.

Probably up to 25,000 stores have been added to cosmetic distribution within the last several years. Many of these stores are heavy-volume producers, particularly in the low- and medium-priced basic staples that we call toilet articles.

The food market has had the usual advantage of being located in a preferred traffic spot; it has certainly had the advantage of in-store traffic; and for every consecutive year there has been a substantial increase in the number of cosmetics and toiletries flooding through them to consumers.

This dynamism is still going on; we have yet to see the grocery supermarket reach a position of stability in cosmetic distribution. It is still growing more than any other retail outlet, as is clearly evident in the reports in the various publications of the food industry, in the continued statements of supermarket executives, in the first faintly perceptible movement of supermarkets into private labeling of toiletry preparations, and in the growing inclination of the big supermarkets to replace the rack jobber with their own direct contacts from this industry.

A few conclusions can be drawn from this changing pattern for distribution of health and beauty products. Let's put them down here in a few words.

(1) The good stores are getting better.

(2) The poor stores are getting worse.

(3) Those retailers with a well-defined cosmetic policy and department are doing better, and those who are simply drifting, with no department personality, are definitely beginning to lose out.

We did not see this particular television program, and probably we would not have liked it, but we were deeply impressed by the criticism which appeared in a television column in one of the daily trade journals. Here is a case of a writer who knows how to write pulling no punches:

"Foolish, Fabulous Flop On Face

"Three critiques are called for in reviewing Monday night's first big nighttime TV fashion special, 'Paris a la Mode,' presented over NBC by Chesebrough-Pond's, Inc., and the Chambre Syndicale de la Couture Parisienne.

"On all three scores—professional fashion, entertainment and general non-pro reaction of the multi-million lay audience for whom it was essentially presented—the criticism can be ticked off in terms of tears (big, wet ones), disgust, guffaws and sorrowful, head-holding disappointment and chagrin.

"It was N.G. all the way—or at least 99 9/10 per cent of the way.

"Let's be fair: They tried. Let's not be sentimental: They failed. In the final analysis, they failed miserably, totally.

"Laywomen interviewed were infuriated because they got little message from the show outside of the commercial cold cream one. They called it embarrassing, vulgar vaudeville, in dreadful taste. Men said 'ugh!' and turned it off.

"At the cost of about half a million dollars spent for prime TV time, for talent and hoopla; unveiling $250,000 worth of hot Paris fashion news; the High

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Just as a boy and his Dad go hand in hand, so do consumer acceptance and products packaged in glass. • Your product can win this coveted consumer acceptance when presented in an attractive glass container by Brockway. • Products packaged in glass have proven themselves to be the products most readily accepted on sight by the consumer. Seeing is believing . . . and when they see your product displayed in a glass container, consumer acceptance is assured. • A product that is worthy of consumer acceptance deserves a quality glass container by Brockway.

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Tygart Valley Glass Co., Washington, Pa.

Court of Fashion and a High Court of Cosmetic-Advertiser Money flopped foolishly on their faces. Fabulously."

New! A scented crystal-clear polyethylene film. Fragrance Process Company, Inc., the makers of scented polyethylene, have developed a wide variety of scents for this process. These scents include Lavender, Tweed, Cedar, Pine, Spruce for men's sport clothing packages, Chocolate and Spearmint. A variety of other scents are being made for packaging such things as women's lingerie, sweaters, handkerchiefs, stockings, food products, and the like.

Scented polyethylene was created by Alfred Neuwald, the president of Fragrance Process and is sold in the form of a resin concentrate which has different aromas or different flavors added. Called Poly-Scent, the concentrate is dry blended in the hopper with U.S.I. Petrothene film grade resin for extrusion. Between ¼ and 2 per cent of scented polyethylene concentrate is used, depending on the scent. These aromas become an integral part of the polyethylene film—they cannot be washed away.

According to U.S.I. Chemical Company's director of plastic sales, Vincent McCarthy, the company that furnishes Fragrance Process with the Petrothene, this new development will increase the versatility of polyethylene and will mean more product and package design possibilities.

A recent survey made by a marketing research organization for the DuPont Company seems to indicate that a trend is in the process of being reversed.

Over the last decade or so—or perhaps, to pinpoint it more specifically, since the supermarket has become an important part of American distribution—there has been a steady increase in the amount of time the American woman spends on specific purchases and a definite increase in the amount of time spent on a shopping tour. At least, this has been true of the supermarket.

The DuPont study, which was made primarily in supermarkets, indicates that the customer is spending quite a bit more time deciding on a purchase than was so in previous years. This particular market research organization and the DuPont Company have a pretty good record of this, because the current survey is the sixth consumer study of buying habits.

This last survey shows that the average shopper spent 27 minutes on each supermarket trip, 50 per cent more time than the 18 minutes she devoted to shopping in 1954. In spite of this, she has been buying only 8 per cent more merchandise.

One conclusion here could be, along the lines that many marketing men have noted recently, that the tremendous number of brands with all their variations in size and qualities, plus the large increase in advertising pressure from every direction, is making the American shopper more and more bewildered.

On the other hand, it may be that the American shopper is becoming more critical.

In addition, does this longer time to make a purchase mean that there is also a decline in impulse buying?

If this latter conjecture were true, it would certainly be a horrid thought for the manufacturers, who are committed to taking over all the functions of selling through their own consumer advertising, and who were the great boosters of self-service. After all, if a customer spends more and more time shopping, it must mean, for one thing, that she is becoming more and more critical and this, in turn, must mean that she would be increasingly interested in talking things over with a really intelligent sales clerk.

A report from southern California supermarket stores states that vitamin sales in 1959 increased, ranging from 100 to 300 per cent greater than in 1958. These sales are on both national brands and private brands, which are making their appearance with increasing frequency in supermarkets.

Here's another approach to defining what a package must accomplish. This is the idea of Richard Waxenberg, president of Eagle Food Centers, a midwestern supermarket chain.

Mr. Waxenberg maintains that a package must be designed to make three separate sales.

The first sale is the seven-second sale, that is, the interval of time that a woman spends in front of a package before purchasing it.

The second sale is the seven-day sale. This is the time a customer has to find out how well a package performs after purchase.

The third sale is the seven-week sale. This is the length of time during which it may be shipped and subject to damage.

Hazel Bishop, Inc., is starting all over again with a new president, a new advertising agency, new advertising promotions, and what have you.

As one of the companies in this trade, we can only wish the best of luck to Hazel Bishop. To say the least, they have not had too much of it in the past, since the company was rather abruptly transferred from its founder, Hazel Bishop, to the advertising agency, which promptly transferred it into a television program rather than a cosmetic company.

According to the new president, the new agency was selected because "the agency's talent in image-building is outstanding, particularly in the package goods field."

We hope this agency will be able to create an image for Hazel Bishop as a cosmetic company, rather than as a sponsor of declining entertainments.

Also, according to the new president, Daniel Van Dyk, "There is no reason why the most glamorous

and finest cosmetics cannot be made available to every woman in America at prices commensurate with the average budget."

We have news for Mr. Van Dyk. For quite a long time now the American woman in any walk of life, in any social environment and in any economic status has been able to get excellent cosmetics at a price she could pay winthin a short distance of where she lives or works. We have 1,000 department stores, 50,000 drug stores, 5,000 drug chains, 12,000 variety stores, 50,000 grocery supermarkets, and over 150,000 house-to-house sales agents all working earnestly to make sure that this is true.

We see no reason why Mr. Van Dyk cannot join this prosperous, important assembly of cosmetic people, and we hope he makes a very nice place for himself and his company among them.

The New Era of the *Sophisticated* Shopper—this is the title of the twelfth study on basic merchandising trends, by E. B. Weiss, director of merchandising of the advertising agency Doyle Dane Bernbach Inc. This is a fact-packed study of 62 pages about the new American consumer.

An interesting question in the food trade is: Will the mass retailers, that is the supermarkets, win a place in specialty and prestige foods, or are the specialty prestige brands of foods just bluntly plunging into mass distribution?

It will be remembered that not many months ago General Foods brought out the much publicized specialty prestige line, Gourmet. According to public announcements, this line was to have a restricted distribution in the fine food departments of specialty stores and department stores.

Now Gourmet is up to its neck in the supermarket field. A recent Boston ad listed more than 100 supermarkets in the greater Boston area alone where Gourmet could be purchased.

This is surely a period where class and mass are being scrambled; just what effect this will have on the future of the specialty retailers and the manufacturers of specialty lines will be an interesting thing to watch.

The toothpaste people have been getting more of their share of adverse criticism for their advertising. One of the roughest criticisms was certainly that by Carl Ruff, a New York public relations consultant, at the annual meeting of the Professional Convention Management Association and the Medical Exhibitors' Association: "The public is faced on the one hand with the fatuous blatancy of exaggerated advertising claims and the negativism of the American Dental Association, on the other.

"It is fantastic," he said, "that no dentifrice manufacturer has a full-scale program worked out in cooperation with the dental associations to educate the public on total oral hygiene. It's common knowledge that one dentifrice is just about as good as another, yet no manufacturer has thought to distinguish and promote his product by identifying his company with the public interest."

Mr. Ruff's solution for all this is a public relations campaign.

The textile industry is going ahead with plans to make textiles germ- and odor-free by various treatments.

The American Viscose Corporation, in connection with the Sanitized Sales Company of America, Inc., has a process to make rayon and acetate fibers germ- and odor-free by "locking-in" Sanitized anti-bacterial additives directly in the spinning mixture.

Anyone involved in the export business knows how easy it is to make mistakes, and that every country is different from every other in some respect.

Here are a few of the things outlined in an article on export selling in a British magazine.

"Color often presents difficulties; in China white is the mourning color, blue is associated with sorrow, and red means rejoicing; in Moslem countries green, the color of Islam, has a special significance. Yellow is unpopular in Moslem countries and in Israel, and has a medical significance in Venezuela because it is the color adopted for all transport and signs of the health authorities."

When you are trying to find an advertising theme in another country, it is a good idea to know something about habits and emotional likes and dislikes. For instance, a great deal of black shoe polish is used in South Africa as an elegant and efficient hair dressing; a purpose for which it was never intended, and one for which it certainly could not be advertised. Another example is the umbrella which, in England, is used to keep off the rain and, in Africa, to keep off the sun.

All this reminds us of the salesman who sold a lot of refrigerators to the Eskimos as a place to store food to keep it from freezing.

A new booklet prepared for the Association of National Advertisers will tell you when an advertisement is honest and legal, and not misleading or deceptive, from the viewpoint of the courts and regulatory agencies.

Here is a lucid sample. "An advertisement is honest when objective facts which bear upon the product or service advertised fulfill in all material respects the understanding regarding them that is generated in people by the advertisement when observed in the way or ways that they normally perceive it."

In order not to be misleading or deceptive, must we have gobbledygook?

News in Packaging . . .

Uncoated Glass Aerosol

Old Empire, Inc., and Par Industries, Inc., have introduced a new uncoated glass bottle for aerosols. The container has a micro-mist valve, and this first style is convoluted. Several other bottle designs are expected to be ready later this year, according to Sylvan Lefcoe, president of Par Industries.

Old Empire is offering the container in the east and Par is making it available in the 13 western states.

Jointly developed by the two concerns, the container holds one and one-half ounces of liquid, and is available with metal overcaps that cover the valve and fit flush with the top of the bottle.

New Package Cushioning Material

Armstrong Cork Company has developed a new interior package cushioning material called Armstrong Resilo-Pak. It has a high energy absorption, is white in color, light in weight, and highly resilient. It retains its physical characteristics from minus 80° F. to 175° F., is dimensionally stable at normal temperatures, has a neutral *p*H, and is nonabrasive, nondusting, and nonhygroscopic.

A film showing a laboratory test of Resilo-Pak includes a severe dynamic test in which a 65-pound weight is dropped 42 inches onto a four-inch thick piece of Resilo-Pak 400, which has a density of 1.5 pounds per cubic foot, with a top surface area of 30 square inches. At the point of maximum compression, the Resilo-Pak is squeezed to a thickness of about one-half an inch, without flowing or bulging at the sides, and without bottoming out. After the weight has bounced upward, the pad of cushioning recovers to almost its original thickness.

Aerosol Has a New Use as TV Channel Control

We hear that out in Bay Shore, Long Island, when hospital patient Edward McBride wants to switch television programs, he can press the remote control gadget, or squeeze a can of air deodorant—either does the trick.

The man was perfectly happy with the show on his remote-control TV set the other night, he just wanted to freshen the air in his hospital room, so he squirted the air deodorant can. Presto, a new TV channel flicked on.

A television specialist explained that through some fluke the deodorant can had created an ultra-high frequency sound wave that triggered the channel-changing mechanism, not only in that set but in ten others it was tried on.

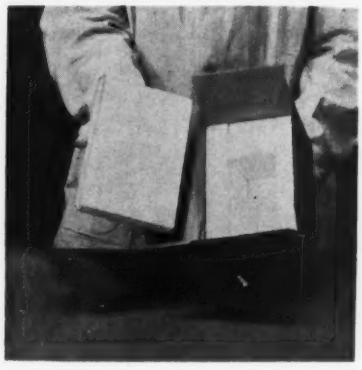
Mennen Redesigns its Spray Deodorant Bottle

The Mennen Company has redesigned that polyethylene squeeze bottle for its spray deodorant for men. The familiar green bottle has had its shoulders widened and its base narrowed, which provides a larger air reservoir, giving a more favorable air-to-liquid ratio. This according to the company, produces a fine mist spray when the bottle is squeezed firmly and released quickly. Greater space for lettering allows the usage directions formerly on the back of the container to be printed prominently on the front: Squeeze quickly and release.

Kimble Glass Company's Optiseal Serum Vial for parenterals has a one-piece, locked-on plastic closure, which gives convenience (it can be opened with one hand), tamper-proof protection of contents, and versatility of design (rubber plugs or discs can be inserted).

New aerosol for Prince Matchabelli's Spray Mist colognes, with transparent lower portion, opaque top to hide the pressure-spray fixture, is tinted over-all with luminescent flecks; cologne and bottle color match, and each fragrance has its own particular tint.

Armstrong Cork Company's new interior package cushioning material, Armstrong Resilo-Pak, a new plastic with very high energy absorption, white, light-weight, and highly resilient, stability at normal temperatures, neutral pH.



Reusable apothecary bottle selected by Lanolin Plus for Rybutol vitamin capsules manufactured by Vitamin Corp. of America displays product well. Glass by W. Braun Company and Wheaton Glass Company; label by Gardner-Neuman.

Linear polyethylene bottles for Compren and Valmid by Eli Lilly and Company are unbreakable, light, inexpensive to ship. Containers by Continental Can Company; metal caps, Armstrong Cork, Owens-Illinois; caps, Phoenix Cap.

These flint glass bottles are from our C-39 line . . . one of our most versatile and attractive styles. Available in either clear glass or frosted and can be supplied plain or with your own fired-on ceramic label. Made in 14 sizes from 1/2 dram to 16 ounce capacity.
Astringent
2 FLUID OZ.
C-39
TOILET WATER
C-39
Perfume
CARR-LOWREY GLASS CO.
Designers and manufacturers of fine glass containers
Factory and Main Office: BALTIMORE 3, MD. • New York Office: 415 MADISON AVE. • Chicago Office: 1572 MERCHANDISE MART

WINNERS OF THE 1960 FOLDING CARTON COMPETITION

in drug and cosmetic packaging, selected in four categories: superiority of printing, construction, potential new volume use, and general merchandising superiority, and sponsored by the Folding Paper Box Association of America.

1. Cytoxan by Mead Johnson & Company, merit award for superiority of construction—use of a styrene pressure-formed tray to protect the small bottles, in a turquoise blue matching the exterior design. Boxmaker—Paper Package Company; designer—Charles Gneagy of Mead Johnson.

2. Benadryl Expectorant by Parke, Davis & Company, merit award for general merchandising superiority—an unconventional and effective package for a new product. Boxmaker—Continental Can Company, Inc.; designer—Lebeau Studios.

3. Bayer Aspirin by Sterling Drug, Inc., merit award for superiority of construction—an ingenious sleeve to which a nonslip adhesive is applied prior to wrapping. Boxmaker—Container Corporation of America; designer—Sterling Drug.

4. Unicaps by The Upjohn Company, merit award for general merchandising superiority, best display—one-piece sloping counter, well-produced copy and art tied directly with consumer advertising. Boxmaker—Weyerhauser Company, Boxboard and Folding Carton Division; designer—Upjohn.

5. Children's Shampoo by John H. Breck, Inc., merit award, superiority of printing, multi-color letterpress—in the familiar gold foil cartons with distinctive treatment of surface design, red and black type and white oval. Printer and boxmaker—Sample-Durick, Company, Inc.

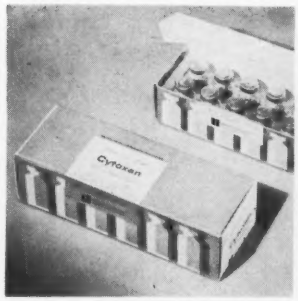
6. Flama Grande nail enamel by Revlon, Inc., merit award, general merchandising superiority—brilliance of color, picture of dancing girl, and appropriate brand name. Boxmaker—F. N. Burt Company, Inc.; designer—Revlon.

7. Fresh deodorant by Pharma-Craft Corporation, merit award, general merchandising superiority—fresh, gleaming appearance of daisy design with reverse type on bright blue foil. Boxmaker—F. N. Burt Company, Inc.; designer—Pharma-Craft.

8. Ivory Shampoo by Procter & Gamble Company, merit award, general merchandising superiority—prominent display of the well-established word Ivory, with look of solidity and quality, red, white, blue, and gold colors connote family use, embossed outline of the bottle itself. Boxmaker—The Richardson Taylor-Globe Corporation.

9. Nair cream hair remover by Carter Products, Inc., merit award, general merchandising superiority—unusual face and surface design with striking shelf appeal. Boxmaker—Container Corporation of America; designer—Ted Bates Advertising Agency.

10. Pink Ribbon Drene by Procter & Gamble Company, merit award, general merchandising superiority—in various shades of pink. Boxmaker—Diamond National Corporation; designer—John Ziegler.



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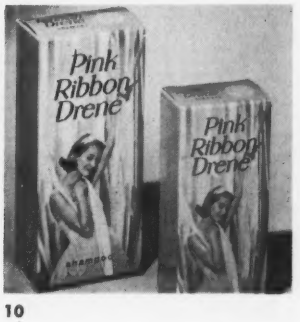

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NEWS and VIEWS

BY TED KLEIN PUBLIC RELATIONS DIRECTOR*

The Interchangeable Man

Not too long ago I found myself at a meeting of what you could call up-and-coming young men in the pharmaceutical industry. It was a typical trade function and, much to my alarm, I noted that almost all of us were dressed alike and ordered more or less the same lunch, with a similar order from the bar; it occurred to me that I was becoming a stereotype.

A few nights later on the radio, Dr. Robert M. Hutchins, noted educator, discussed "The Future of the Free Society." He spoke of "the interchangeable man," a phrase I had never heard before. It categorized my worry.

It was Dr. Hutchin's view that, if our society is to survive and be strong, the "dissatisfied" man must be the cornerstone of the system. And yet, the large corporation of today often demands that its young executives be reliable graduates from good colleges, as well as "safe" in every respect. Hutchins said that these requirements, no less real for being unwritten, have resulted in a stereotyped individual, the interchangeable man.

This seems to me a dangerous state of affairs. If all a company wants is a safe individual who will offend no one, who will go along with his management and not make any waves, then I think that company will eventually run into trouble.

The men of American industry who pioneered in making our country the most successful capitalistic state in the history of the world were not conservatives playing it safe. They were individuals. The Fords, the Rockerfellers, the Carnegies, all had one thing in common —a deep-abiding disatisfaction with their lot, and the strength (and the luck) to try changing things.

If today's trend continues, and more young men, my friends and the sons of my friends, are raised to be company men hiding their individuality with their dissatisfaction, we are sure to lose a great deal.

We cannot get along without the creative spark of free men which makes them eager to change things for the better.

Here is a vote against the interchangeable man—and a prayer for that fellow with the courage to ask and plan for something different, even if it may mean being fired for being a mal content.

Please Pass the Scalpel

Some time ago in this space I suggested that the pharmaceutical industry should investigate the possibility of sponsoring a program showing the advances of modern medical practice.

Station KRON-TV in San Francisco is producing a television series offering full-hour surgical operations called "Medicine 1960."

AMA Study

"A Commission on the Cost of Medical Care" will delve into every phase of medicine where cost or spending is involved, according to a recent announcement of the American Medical Association.

Dr. L. M. Orr, president of the A.M.A., said: "we would like to find where economies may be achieved in the best interest of the patient. The commission will analyze the cost picture from every angle and try and come up with some sound advice and suggestions."

This effort, no doubt inspired by the activities of Senator Kefauver, will make interesting reading in the pharmaceutical world. With a report due in a few months, I wonder if the industry will have a detailed study of its own ready, to answer some questions from our side of the fence.

Get into the Act

Along with the public's concern on the far-reaching effects of the quizz show scandal and the payola inquiry, an association of executives of radio and television has come up with three suggestion which may have some helpful ideas for our industry.

(1) "Use your own station breaks, 10 or 20 times each day to flash a series of brief messages on what your station has done during the past year for its audience."

Similarly, we could use our advertising to the public and physicians to impart information on the industry's accomplishments to those among whom it could do some good.

(2) "Have your own staff write a series of 3-second or 5-second messages."

Are we using our house organs as fully as possible in educating our own employees on our contributions to the health of the nation?

(3) "After using your own messages, exchange copies with fellow broadcasters in your own area, or friends of yours far away, thus keeping a steady flow of fresh messages with a variety of new and different approaches."

Do we exchange our house organs and institutional ads so that we all know what each of us is doing?

We need far more cooperation among public relations executives and advertising men in the industry to organize our efforts in public information. The Pharmaceutical Manufacturers Association is doing a lot, but if individual companies worked together more closely, a better public image would result.

M.E. Forum

Dick Cliggott of *Medical Economics* reported to me recently that the first M.E. Forum was a great success. Over 300 physicians attended an all-day session in Boston to hear experts suggest how the physician could improve his methods of doing business.

The doctors, each of whom paid $20 for the session, heard such speakers as Rene Wormser, trust expert; Gerald Loeb, stockholder; and Melvin Belli, malpractice attorney.

Such an audience shows a genuine need for the program. Hats off to M.E. for a good public relations project, namely, one that serves an important need.

Definition of Public Relations

Public Relations News, a long-established expert in matters of PR, has printed about the best definition of the business I have seen: "Public Relations is the management function which evaluates public attitudes, identifies the policies and procedures of an individual or an organization with the public interest, and executes a program of action to earn public understanding and acceptance."

*Paul Klemtner & Company, Inc.

Patent thoughts and trends

BY THOMAS CIFELLI, JR., PATENT ATTORNEY*

More on New Uses of Old Materials

About three years ago we devoted an entire article to the question of whether new uses for old materials are patentable. The purpose of that article was to try to put at rest the canard-like, prevalent idea that new uses of old materials could not be patented. The article went into some detail in pointing out how protection could be obtained in such cases.

On re-reading the article in question it is apparent that it now gives the wrong impression with respect to the practical value of process patents. It threw cold water on process claims as compared with product or composition claims, stating that the latter were more valuable in most cases than "mere process claims."

While the statement by itself is more or less still believed to be correct, nevertheless, it is felt that it does not completely represent the situation as it exists today. This is so, because of a trend which the writer has discerned in court decisions following April 1957, the date of the article referred to. One of these decisions has been singled out for special attention because it is believed to be of general interest to the readers of this journal.

The cases referred to involved Rohm & Haas, which sued Roberts Chemicals for patent infringement under Hester Reissue Patent 23742, and was decided in May of 1957.

The patent dealt with the use of disodium salt of ethylene bisdithiocarbamic acid, familiarly known as Nabam, or related salts of the same acid, as an active ingredient in fungicidal compositions suitable for application to living plants.

That the discovery of this use was of great practical value is clear from the opinion of the court (Court of Appeals, Fourth Circuit):

"There is no question that the discovery of the useful qualities of Nabam and its related salts has been followed by wide use in the agricultural field. There had long been the need among farmers for a fungicide which would kill the fungus without in some way damaging or destroying the plants themselves, and the problem was to develop a material with the fungicidal properties of high efficiency with a minimum toxicity to the growing plants. Nabam was the first of the fungicides to possess these properties in a satisfactory measure. The discovery was made by Hester, a chemist in the laboratory of Rohm and Haas, after a great number of compounds had been tested according to standard procedure. Nabam had theretofore been known to the chemical world as the product of interaction of ethylenediamine with carbon disulfide but it does not seem to have been made use of for practical purposes. It was tried, however, by Hester along with many other compounds and it was only after one or two unsuccessful tests that it was found to possess the qualities desired.

"Since the discovery it has had great commercial success and seems to have finally solved a long-standing problem. It was introduced in 1944 and since that year, when $100,000 worth of material was sold, sales have progressively increased until, it was estimated at the time of the trial, ten times as much Nabam was sold as the other well-known fungicides Ziram, Ferbam and Thiuram, which are manufactured and sold by the duPont Company. The duPont Company itself began to manufacture and sell Nabam and its related salts in 1947 and took a license under the reissue patent after it was granted in 1953."

Accordingly, the court rejected the contention that the prior art rendered the invention unpatentable, even though it conceded that with the knowledge now available a skilled chemist might find in the prior art sufficient information to anticipate the Hester invention. It noted that practical men in the art who possessed ample facilities and were advised by qualified research chemists did not find in the prior art the solution of the problem. Moreover, the principal prior art patent was owned by duPont, which for years had been active in the manufacture and sale of fungicides, but had not learned that the answer to the problem lay in the use of Nabam, a bis compound. Indeed, the court found that duPont joined in the manufacture and sale of Nabam in 1947 and took a license under the Hester Patent after it was reissued in 1953, as already noted.

The only claims in the reissue patent dealt with the process of controlling fungus growth on living plants by applying to the plant a fungicidal composition having as an active ingredient a salt of an alkylene bisdithiocarbamic acid.

There were several legal contentions made by way of attack on the

*Richards and Cifelli, Newark 2, New Jersey.

patent. No effort will be made here to go into them, except to say that in meeting one of the contentions it was necessary for the parties and the court to consider a problem that is often referred to as mis-use of patents. This led to the ruling by the court which, in the writer's view, points out the potential value of process patents. The court pointed out that the established rule of patent law for many years was that a patentee selling an unpatented part or component for use in a patented combination or process is denied enforcement of the patent against competitors selling similar articles for the same purpose. This rule had become well settled by reason of a number of decisions of the U. S. Supreme Court. One of these decisions, often referred to as the Mercoid case, after one of the parties involved in it, went so far as to hold that this doctrine applied even though the unpatented part was specially made and had no other use than in connection with the patented combination.

The court then considered whether the Patent Act of 1952 changed the picture at all. It first pointed out that the new act modified the old rule as to the unpatentability of a new use of an old product, by providing that the term "process" includes a new use of a known process, composition of matter, or material. The result is that one who invents or discovers any such process may obtain a patent therefore under the provisions of the new act.

The court then considered section 271 of the act. Because of its pertinence, sub-section C is set forth in full:

"Whoever sells a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer."

The evidence showed tht Nabam, apart from its use as fungicide, is not a staple article of commerce, and the court ruled that the patent owner could bring suit for contributary infringement against sellers of the composition who knew that it was especially adapted for use in infringement of the patent.

As indicated above, it is the opinion of the writer that the trend of decisions is along the lines of the case just considered. The Rohm & Haas case was decided by the Court of Appeals for the Fourth Circuit. The U. S. Court of Appeals for the Second Circuit recently in one of its decisions had occasion to circumvent the results of the Mercoid doctrine, although it did not find it necessary to rely on the legislative change brought about by the Patent Act of 1952. There have been other decisions of lower federal courts that have given effect to the provision of section 271 of the Patent Act as having more or less changed the law. However, the U. S. Supreme Court itself has not spoken and until it does no one can be certain as to what the final situation will be.

Nevertheless, it can be seen that, as matters stand now, a holder of a process patent dealing with the use of an unpatented product which is *not* a staple article of commerce and not capable of substantial noninfringing use has a powerful patent right. Indeed, in some cases it might be about as effective as if the patent covered the product that he was selling. For example, in the Rohm & Haas case it is indicated that the patent owner made and sold the unpatented Nabam without issuing any license to the purchaser for its use. Still, the patent owner was permitted to sue a competitor who sold the unpatented ingredient.

Another important limitation to keep in mind is that whatever the unpatented ingredient may be in order for effective process protection under the Rohm & Haas situation, it is necessary that the unpatented ingredient be what might be termed a laboratory curiosity before the invention. In other words, Nabam had no practical use and therefore could not be said to have a substantial noninfringing use or to be a staple article of commerce. On the other hand, if one were to find a meritorious use for a common material, say table salt, and obtain a patent on its use, whether in terms of process or composition, it is practically certain that the courts would not permit any suit by the patent owner against competitors who sell table salt, even though those competitors could be shown to have knowledge that the salt was to be used to infringe the patent. Salt is, of course, a well-known staple article of commerce capable of rather substantial noninfringing uses.

Consequently, in spite of the foregoing, the writer knows that people will continue to pontificate knowingly to the effect that new uses of old materials cannot be patented and that any patent obtained on a new use isn't worth the paper it is printed on.

RECENT PATENTS

2,925,365—Smith, Kline & French—Coloring Solid Pharmaceutical Forms.

2,925,416—G. D. Searle—Dioxygenated Carboxyethyl Halo-Androstenol Lactones.

2,925,417—Parke, Davis—Quinolium Salts of Pamoic Acid.

2,925,418—Ciba—Triazines.

2,925,420—Abbott Labs. — Piperazines.

2,925,428—Syntex—Estrapentaenes.

2,926,119—Rohm & Haas — Quat. Ammonium Bactericides.

2,926,121—Am. Home Products — Therapeutic Candy-Like Product.

2,926,141 — Monsanto — Antiseptic Soap Compositions.

2,926,162—B. F. Hart — Flavanone Compound.

2,926,165—U. S. Vitamin Corp. — Oxymethylguanamines.

2,926,166—Burroughs Wellcome — Pyrimidines.

2,926,170—Ortho Pharmaceutical — 1-Acyl-3-Undecyl Pyrazoles.

2,926,181—Syntex—Pregnadienes.

2,927,057—Wisconsin A.R.F. — Oligomycin.

2,927,108—Schering — Bis Ketals of Costisone.

2,927,109—Upjohn—Androstanes.

2,927,111—Lakeside Labs. — Tropyl Hydrazines.

2,927,112—Sterling Drug — Halopyridazines.

2,927,114—Am. Cyanamid — Piperazinediones.

2,927,115—Soc. Usines Chim. Rhone-Poulenc—Aza-Bicyclo-Octanes.

2,927,116—Parke, Davis — Chlorobenzimidazolones.

2,927,119—British Drug Houses — Androstanes.

2,927,132—May and Baker—Benzamidoalkanes. •

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Modern machines and unexcelled materials and craftsmanship combine to make Colonial Applicator Company a leader in plastic droppers and assemblies.

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VINELAND, NEW JERSEY

From left to rght: Lewis A. Dibble, Jr., who has been elected executive vice-president of The Risdon Manufacturing Company, and Donald S. Tuttle, Jr., now a vice-president of the company; Harold N. Anderson,

who has been promoted to the position of manager of cosmetic color sales, and Andrew J. Torter, also promoted, to assistant sales manager of the color and flavor divisions of H. Kohnstamm & Company, Inc.

NEWS...

Appointments and Promotions

Lewis A. Dibble, Jr., has been elected executive vice-president of **The Risdon Manufacturing Company.** Formerly a vice-president, Mr. Dibble has been with Risdon for 14 years. Three vice-presidents have been elected: Donald S. Tuttle, Jr., who is sales manager of the Cosmetic and Aerosol Divisions; Lawrence F. Heilman, managing director of the Cosmetic and Aerosol Divisions; and Edward Noyack, managing director of the Naugatuk and waterbury plants. Mr. Tuttle and Malcolm Baldridge were elected directors, as well. Mr. Baldridge is vice-president of the Eastern Malleable Iron Company of Naugatuk.

H. Kohnstamm & Company, Inc., has promoted Harold N. Anderson to the position of manager of cosmetic color sales and Andrew J. Torter to that of assistant sales manager of the color and flavor divisions. Both have been with the company since 1929, and have served in sales capacities in recent years.

Anthony Oladko, vice-president of domestic manufacturing for **Chesebrough-Pond's Inc.,** has been elected a director of the company. Mr. Oladko joined the firm in 1957 as general manufacturing manager and was named vice-president of domestic manufacturing a year later.

David J. Fitzgibbons has been elected a vice-president and executive assistant to the chairman and president, for **Sterling Drug Inc.** He has been with Sterling's international business operations for the last 22 years, most recently as vice-president and treasurer of Sterling Products International, Sydney Ross Company, and Winthrop Products Inc. J. Negley Cooke, Jr., a vice-president of Sterling and president of its **Glenbrook Laboratories Division,** has been elected a member of the board of directors. With the firm for 25 years, Mr. Cooke was elected a vice-president in charge of marketing and sales promotion in 1955 and Glenbrook president in 1958. Andrew W. Pangrace has been appointed process manager of the Bayer Aspirin plant of the Glenbrook Division. His former position as supervisor of the sterile techniques department at the Myerstown, Penna., plant of **Winthrop Laboratories** has been assumed by Philip K. Angstadt, a chemist in that plant.

The Karl Kiefer Machine Company has appointed Paul R. Fechheimer as president and executive officer. James A. Rheinstrom, who has been president for 29 years and, prior to that, vice-president for 21 years, is now chairman of the board. Harry C. Goeltz is vice-president and Philip V. V. Hurlburt is sales manager.

Henry Kersh has been promoted from director of operations, International Division, to president, special projects assistant, of **Revlon, Inc.** He has been with the firm for 14 years. Jean-Jacques Strauss, known professionally as Francois, has been appointed beauty director.

Seymour Nordenberg has been elected president of **Stineway Drug Company** and **Ford Hopkins Company,** and Gerald B. Block was re-elected president of **General Stores Corporation,** the parent company. Mr. Nordenberg and Samuel N. Bergman were also elected as Stineway-Ford Hopkins director.

The general manager of the **Maywood Chemical Company Division of Stepan Chemical Company,** Donald H. Francis, has been made a vice-president of Stepan, the parent company, in addition to his duties with Maywood. Mr. Francis joined Stepan seven years ago as chemical engineer, later becoming director of engineering.

Howard K. Vander Linden, formerly president of Rexall Drug Company Ltd., of Canada, has been appointed to the newly created position of vice-president and general sales manager of the **Rexall Drug Company.** Beginning with Rexall in 1947 as a sales trainee, Mr. Vander Linden has served in various executive capacities.

Philip Ritter, III, has been elected a vice-president of **The Wm. S. Merrell Company.** He began with Merrell in 1953 as advertising manager, finally assuming responsibility for all of the company's marketing. He is also a director.

The Allen B. Wrisley Company, a wholly owned **subsidiary of Purex Corporation, Ltd.,** has elected Robert N. Harris vice-president and director of marketing. Mr. Harris has spent the past five years with Edward H. Weiss & Company, one of Purex' advertising agencies, before which he was with Toni.

R. Dean Thomas has been assigned to the sales staff of the Animal Nutrition Department of **Commercial Solvents Corporation** in southern California and Arizona. He has been in the sales department since 1957.

From left to right: Frank Dowe, special sales representative for the Fine Chemicals Division, Hoffmann-La Roche Inc.; Edward H. Bowen, Jr., M.D., director of clinical research, Baxter laboratories, Inc.; Dr. Christopher H. Costello, director of research, Colgate-Pharmaceutical Laboratories Division, Colgate-Palmolive Company, a newly created position; and Gustav Carsch, technical service director, with Roure-Dupont, Inc.

Frank Dowe has been named special sales representative for the **Fine Chemicals Division of Hoffmann-La Roche Inc.,** with headquarters in New York City. Originally associated with General Mills as vice-president of the Special Commodities Division, Mr. Dowe specialized in the sale of Vitamin D and wheat germ oil, more recently, the improved pure synthetic forms of vitamins A and E.

Baxter Laboratories, Inc., has appointed Edward H. Bowen, Jr., M.D., as director of clinical research. Dr. Bowen was formerly a member of the clinical staff of Smith Kline & French Laboratories.

Dr. Christopher H. Costello is now director of research for the **Colgate-Pharmaceutical Laboratories Division of Colgate-Palmolive Company,** a newly created position. Dr. Costello has been with the Columbus Pharmacal Company, most recently as vice-president and scientific director.

Gustav Carsch has been appointed technical service director of **Roure-Dupont, Inc.,** a newly created position. Mr. Carsch has formerly served as chief perfumer of The Toni Company and later of Lanolin Plus, Inc., as well as Chicago branch manager of Polak & Schwarz Inc.

New sales representative for the **Onyx Oil and Chemical Company** is Richard M. Gorman, covering Ohio, West Virginia, eastern Michigan, and northwestern New York. His headquarters are in Cleveland. Mr. Gorman was formerly with Davison Chemical Company.

C. Richard Myers is now branch manager of the Chicago sales office of **Firmenich, Incorporated.** He was formerly assistant branch manager, before which he had served as technical sales representative for Sterwin Chemicals.

Clifford E. Oman has been named assistant to the director of production at **U. S. Industrial Chemicals Company, Division of National Distillers and Chemical Corporation.** He had been Tuscola general manager with responsibility for operations at U.S.I.'s petrochemical plant at Tuscola, Ill., before which he had served there as an area superintendent. James R. Smith, plant manager, succeeds him.

Kendall D. Doble, Jr., has been elected president of **Pneumatic Scale Corporation, Ltd.,** succeeding his late father, Kendall D. Doble. Since joining the company in 1952, he has assumed responsibility in several key positions. In 1955 he became a vice-president and director, and a year later was named executive vice-president.

G. J. Williams has been advanced from sales manager of the plastics department, a position he has held since 1958, to a new position as assistant general sales manager of **The Dow Chemical Company.** Arnold A. Butterworth, appointed to succeed Mr. Williams, has been assistant to the sales manager in that department.

Mead Johnson & Company has named John T. Sime, Ph.D., as director of nutritional product planning in the product planning department. Before joining Mead Johnson, Dr. Sime was director of nutrition research and education for the Evaporated Milk Association of Chicago.

From left to right: Richard M. Gorman, sales representative for the Onyx Oil and Chemical Company; C. Richard Myers, branch manager of the Chicago sales office for Firmenich, Inc.; Clifford E. Oman, assistant director of production, U. S. Industrial Chemicals Co.; and Kendall D. Doble, Jr., who has been elected president of Pneumatic Scale Corporation, Ltd., to succeed his late father, Kendall D. Doble.

From left to right: Robert D. Workman, president and treasurer, The Warren-Teed Products Co.; John L. Hammer, Jr., assistant to John T. Connor, president of Merck & Co., Inc.; Thomas Miserendino, vice-president and perfumer, Flam-Haft Laboratories, Inc.; and Dr. John M. Longfellow, who has become director of research and development for the Mennen Co., and will serve on Mennen's product development committee.

The Warren-Teed Products Company has elected Robert D. Workman, formerly executive vice-president and treasurer, to the position of president and treasurer, to succeed R. S. Warren, founder of the company and president. Mr. R. S. Warren is to continue as chairman of the board of directors. John R. Warren was elected executive vice-president and secretary; A. Glenn McClelland was named assistant secretary. The new president has been with the firm since 1928.

John L. Hammer, Jr., has been appointed assistant to John T. Connor, president of **Merck & Company, Inc.** Mr. Hammer was formerly assistant to the president of Mississippi Lime, before which he was Monsanto's director of marketing. In the **Merck Sharp & Dohme Division,** William B. van Buren, counsel with the company since 1957, has been appointed assistant to the general manager. And Dr. Chester S. Keefer, director of the Medical Center of Boston University-Massachusetts Memorial Hospital and president-elect of the American College of Physicians, has been elected a director of Merck & Company, Inc. Since 1940, he has been Wade Professor of Medicine at Boston University School of Medicine.

Thomas Miserendino has joined **Flam-Haft Laboratories, Inc.,** as vice-president and perfumer, in charge of the expanded perfume and flavor departments. He had been vice-president and chief perfumer for Perfumery Associates and Ph. Chaleyer, Inc.

Dr. John M. Longfellow, formerly associated with Colgate-Palmolive, Inc., in the research and development division, has become director of research and development for **The Mennen Company,** and will serve on the firm's product development committee.

Seymour Taylor, formerly marketing manager for proprietary drugs at Chas. Pfizer & Co., Inc., has joined the pharmaceutical division of **The Shaller-Rubin Company, Inc.,** as an account executive. He will work primarily with the Thayer Laboratories Division of Revlon, Inc.

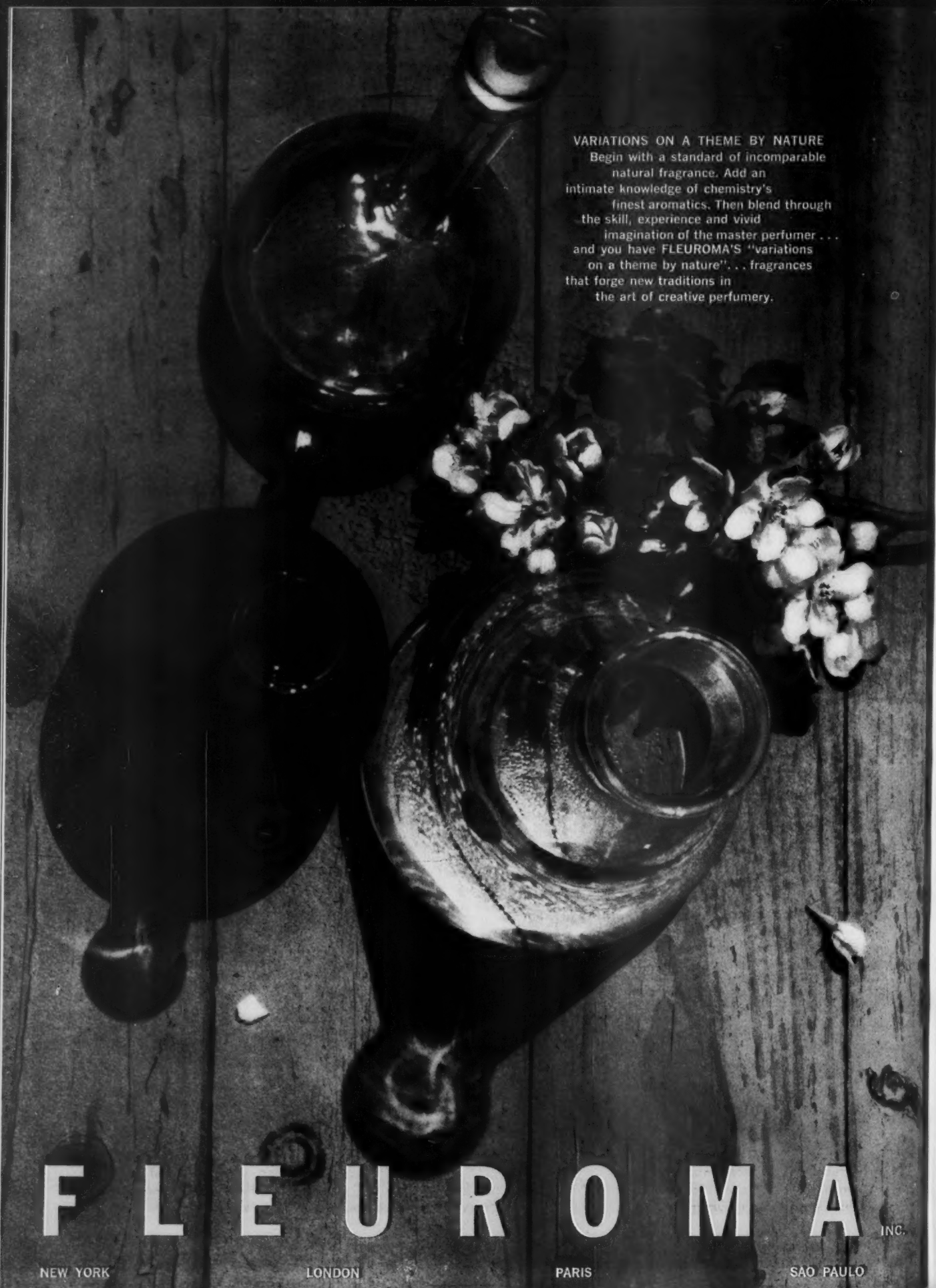
The **Atlas Powder Company** has elected Max E. Colson and Edward J. Massaglia to its board of directors. Mr. Colson, a vice-president of Atlas and general manager of its Explosives Division, joined the firm in 1935. Mr. Massaglia, a vice-president of Atlas and general manager of the Chemicals Division, joined the firm in 1955, having formerly served with Pfizer International, Inc.

Eli Lilly and Company has elected Truman D. Hoover and Joseph E. Marmon to the board of directors. Both men, in addition to Lot Green, were elected vice-presidents of the company. Mr. Hoover, with the firm for 35 years, was made vice-president of biochemical manufacturing; Mr. Marmon, who joined Lilly 21 years ago, is vice-president of industrial relations; and Mr. Green, executive director and director of engineering, is vice-president of engineering. He has been with Lilly for 25 years. Oscar M. Helmer, Ph.D., has been made research advisor in recognition of his scientific contributions, as an authority in hypertension, in hematology and gastroenterology. He was largely responsible for the discovery of angiotensin. Named pharmaceutical research associate is Verlin C. Stephens, Ph.D., an important contributor to the discovery of an erythromycin derivative for oral use. Charles M. Gruber, Jr., M.D., who joined Lilly in 1953 as a physician, has been named a senior physician in the **Lilly Laboratory for Clinical Research.** His field is the clinical evaluation of drugs in the field of analgesics and hynotics. George L. Varnes has been named president of the **Elanco Products Company,** which has been formed by Lilly to market items for agricultural, industrial, and home use. Mr. Varnes began as a salesman with Lilly in 1940, was named executive director of the agricultural and industrial products division in 1954, and in 1958 became a director of Corn State Laboratories, Inc., a subsidiary which manufactures and distributes veterinary drugs. New manager of the quotations department is James M. Gorrell, assistant manager since 1950, succeeding Fred C. Abendroth who has retired.

The **Evans Research and Development Corporation** has elected Dr. Murray Berdick and Dr. William E. Holland as vice-presidents, the former with administrative responsibilities for the laboratory, and the latter with responsibility for client liaison and contract administration. Dr. Berdick joined Evans as a project leader in 1946 and has been a coordinator of Research since 1953. Dr. Holland began with Evans as development manager in 1955.

Bourjois, Inc., has appointed Ames W. Howlett as assistant to the president. He has represented Bourjois in the Midwest since 1956.

Frank W. Olson has been made group leader in the Toilet Articles Division's research and development department of **Colgate-Palmolive Company** which he joined in 1950.


VARIATIONS ON A THEME BY NATURE
Begin with a standard of incomparable natural fragrance. Add an intimate knowledge of chemistry's finest aromatics. Then blend through the skill, experience and vivid imagination of the master perfumer . . . and you have FLEUROMA'S "variations on a theme by nature". . . fragrances that forge new traditions in the art of creative perfumery.
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NEW YORK
LONDON
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SAO PAULO

From left to right: Three of the four new vice-presidents that have recently been elected by Plough, Inc., Dr. Harry W. Feinstone, vice-president, scientific administration; Maurice D. Plough, vice-president, administrative; and Landon J. Smith, vice-president, sales; and Francis A. Mina, Ph.D., who has joined the research staff of Reed & Carnrick, where he will be principally concerned with clinical research.

Four vice-presidents have been elected by **Plough, Inc.:** Dr. Harry W. Feinstone, vice-president, scientific administration; Maurice D. Plough, vice-president, administrative; Landon J. Smith, vice-president, sales; and Dan C. Hallford, vice-president, industrial relations. Dr. Feinstone, responsible for research and quality control in his new position, has formerly served as head of the chemotherapy laboratories, American Cyanamid Company, director of biological research, Nepera Chemical Company, and scientific director, C. B. Kendall Company. He became Plough's director of research in 1958. Maurice Plough has been with Plough since 1939, in several capacities with several subsidiaries, most recently as assistant to the president of the parent company. Mr. Smith joined Plough as national chain store sales manager in 1952, and was promoted to national wholesale sales director in 1953. Mr. Hallford has been with the firm for 14 years, beginning in 1955 as assistant to the vice-president. Harold Klaus, formerly assistant national wholesale sales manager, has been promoted to wholesale sales manager, replacing Mr. Smith.

Francis A. Mina, Ph.D., has joined the research staff of **Reed & Carnrick,** with primary concern in clinical research. Dr. Mina was formerly technical director for Lodes Aerosol Consultants, Inc. He had been technical director of Chemway Corporation.

New assistant brand manager in the **Lehn & Fink Division of Lehn & Fink Products Corporation** is Bruce W. Johnson, who has been with the firm since 1958. Replacing him as assistant to Edgar W. Nelson, division general manager, is William S. Watchman, Jr., who has been with the firm in market research and corporate planning since 1959.

Four scientists have been appointed to its staff by the **Squibb Institute for Medical Research:** Dr. Bernard Haines in the pharmaceutical research section; Dr. Zola Horovitz in the pharmacology section; Dr. Irwin Lippmann in the pharmaceutical research section; and Dr. Robert Thomas in the microbiology section.

Raymond K. Meffen has been appointed vice-president of **Hazel Bishop, Inc.** Mr. Meffen has been general sales manager of Clairol, director of sales for the Lentheric Division, Olin Mathieson Chemical Corporation, and, most recently, vice-president and director of marketing for Hazel Bishop.

National publicity director for **Cigogne, Inc.,** is Michael Sean O'Shea. Concurrently, Mr. O'Shea is national publicity director for the American Theatre Wing, and a free-lance writer.

Two new vice-presidents, Chester Firestein and Lee Rosene, have been elected by **Max Factor & Company.** Mr. Firestein is director of the firm's United States merchandising, and Mr. Rosene, director of United States sales. Mr. Firestein joined the firm in 1955 and became director of United States merchandising two years later. Mr. Rosene began in 1936 as a sales representative, becoming regional sales manager in 1951 and director of U. S. sales in 1957.

Gordon Nugent Joins GCMI

Gordon W. Nugent has joined the Glass Container Manufacturers Institute as director of community relations, to assist the industry's executives in matters of public interest in the community, the state, and in even wider geographical areas.

Mr. Nugent has held several public relations posts, among them with General Electric and with Lederle Laboratories Division, American Cyanamid Company.

Kohnstamm Marks 110th Year

More than 350 executives and employees of H. Kohnstamm & Company, Inc., attended a dinner recently at the Robert Treat Hotel in Newark, N. J., to celebrate the firm's 110th year.

Paul L. Kohnstamm, president, addressed the group, stressing the outstanding contributions made by the company's scientists and technicians.

Awards were made during the dinner to 30 employees, some of whom have been with the company for more than 50 years.

Budd and Dunney Honored

In recognition of their 25 years of service to Ungerer & Company, Ivon H. Budd and William H. Dunney, Jr., were recently presented with engraved gold wrist watches by Frederick H. Ungerer, chairman of the board, at a luncheon presented by the Twenty-five Year Club, of which they are now members.

Mr. Budd is a director and first vice-president of the company, and Mr. Dunney is now director of perfume laboratories and vice-president. He came to Ungerer with his father, Wm. H. Dunney, Sr., and Mr. Budd, when the Budd Aromatic Chemical Company joined Ungerer & Company.

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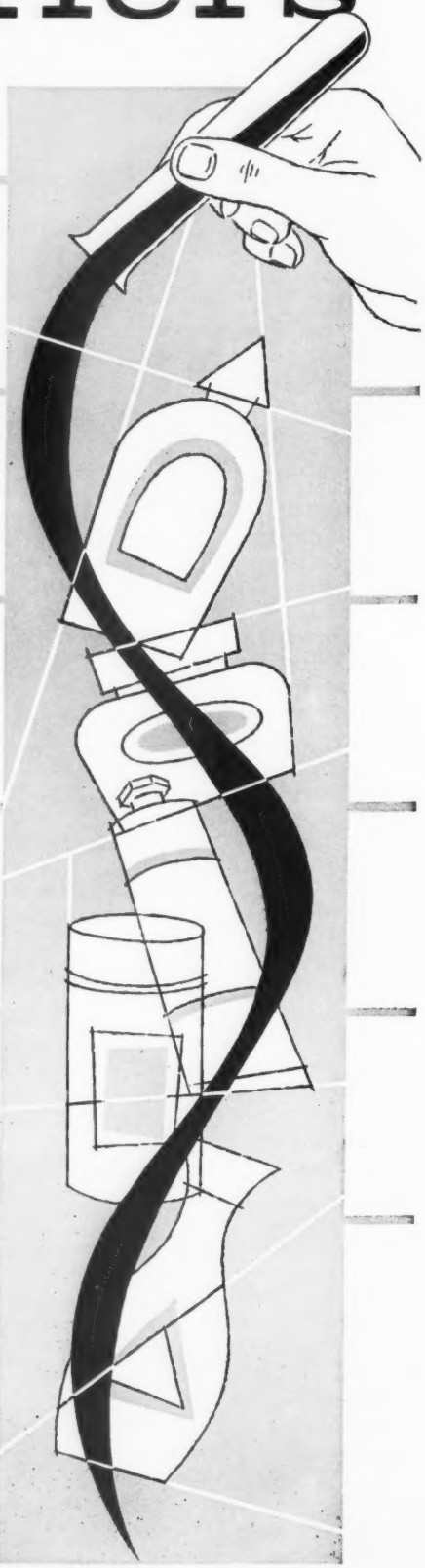
Emulsifiers

For ease of use — For dependable results —
For solving difficult problems



Tegacid...

Glyceryl Monostearate — Acid Emulsifying. For anti-perspirant — deodorant creams, lotions and ointments — all greaseless, medicated formulations.

Tegin...

Glyceryl Monostearate — Self Emulsifying. For neutral greaseless creams, lotions, ointments, suntan creams.

Tegin 515...

Glyceryl Monostearate — Non Self-Emulsifying. Used in conjunction with auxiliary emulsifiers.

Tegin P...

Propylene Glycol Monostearate — Self Emulsifying. For greaseless creams—brushless shave, foundation, suntan: lotions — foundation, suntan, ointments.

Lanolin Absorption Bases

PROTEGIN X.....ISO-LAN

For Creams, Lotions, and Ointments

• TEGOSEPT PRESERVATIVES ESTERS OF PARAHYDROXYBENZOIC ACID

• ANTIOXIDANTS PROPYL GALLATE ETHYL GALLATE

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SALES REPRESENTATIVES

CHICAGO • LOS ANGELES • ST. LOUIS • MONTREAL • TORONTO

E. F. Copp Retires

Earl F. Copp, vice-president of The Risdon Manufacturing Company for 25 years, has retired from that position to become special consultant to the company. He also continues as a member of the firm's board of directors and executive committee.

EARL F. COPP

Mr. Copp directed the operations of Risdon's Cosmetic, Aerosol and Metal Goods Divisions. He joined Risdon in 1935, was elected a vice-president in 1936, director in 1944.

New CIBS Committees

The new committee chairmen and members of their respective committees for the CIBS are as follows:

Publicity and Award, chairman, Paul Alexander, DRUG AND COSMETIC INDUSTRY; Samuel I. Zuckerman, H. Kohnstamm & Company; Thomas Morgan, MacNair-Dorland & Company.

Luncheon Program, chairman, Dallas D. Roush, Owens-Illinois Glass Company; George Holloway, Chesebrough-Pond's, Inc.; John J. Palmer, Peerless Tube Company; Jules Weinstein, Max Factor, Inc.; Robert L. Williams, Avon, Inc.

Membership, chairman, Allan Stewart, Parfait Promotional Pkge. Co., Gordon Petrie, Scoville Manufacturing Co.; Sam Lambert, Surrey Products Division; Edward Monosson, Coty, Inc.

Auditing Committee, chairman, Shaw Mudge; Gene Roberts, Lanvin Parfums, Inc.; Ned Twombley, M. W. Parson-Plymouth, Inc.

General Program, chairman, Shockley C. Gamage, Magnus, Mabee & Reynard, Inc.; Christmas Dinner Dance, chairman, Howard T. Kaneff, Ar-Kay Printing Co., Golf Committee, chairman, H. Robert Miller, White Metal Manufacturing Co.

A. Lerner Receives SCC Award

The 1960 Special Award of the Society of Cosmetic Chemists and its prize of $1,000 goes this year to Dr. Aaron Lerner in recognition of his work on enzymes and hormones controlling skin pigmentation. Dr. Lerner, professor in the Yale University School of Medicine, is to receive the award at the Society's meeting on May 12, at the Hotel Biltmore in New York City

AARON LERNER

A.M.A.'s Conley Becomes Consultant to Hoffmann-La Roche, Inc.

Dr. Bernard E. Conley has resigned as director of the Committee on Toxicology of the American Medical Association to become medical research consultant to Hoffmann-La Roche, Inc. He will maintain offices in Chicago.

Dr. Conley joined the A.M.A. in 1947, and since then he has helped to develop and influence the programs of the Association's Committees on Toxicology and Pesticides. These programs have received an award for outstanding public service from the National Safety Council, and commendations from several other national organizations for achievements in the prevention of accidental poisoning.

Prior to his 12 years with the A.M.A., Dr. Conley served as regional director of pharmacy service for the Veterans Administration in Ohio, Michigan, and Kentucky.

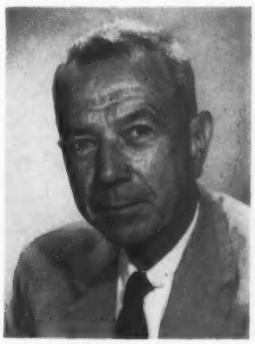
Avon Completes Mildand Center

Avon Products, Inc., has completed its newly constructed sales and distribution center at Midland and Peck Avenues in Rye, New York. This is also the headquarters of Avon's eastern sales branch and the International Division.

Walden Retires from Lilly

George B. Walden, vice-president in charge of biochemical manufacturing at Eli Lilly and Company, has retired. He continues as a member of the board of directors.

Mr. Walden joined Lilly as an analytical chemist in 1917 and was elected a vice-president in 1952.



GEORGE B. WALDEN

Areas reporting to him include chemical manufacturing, glandular products manufacturing and development, antibiotic operations, and the Tippecanoe Laboratories. He played a key role in working out the large-scale production of purified, stable Insulin for diabetics.

H. W. Bull of Dow Honored

H. W. Bull, head of the packaging department and packaging coordinator at Dow Chemical Company, was recently presented with the Michigan State University Packaging Society's "Man of the Year" award.

The award was presented to Mr. Bull for his long interest in the program at Michigan State, and his personal contributions to its success.

Abe Plough, president, Plough, Inc., and its first shareholder, welcomes Leon T. Cochran, a member of the firm's industrial engineering staff, as the 6,000th shareholder, and one of 228 employees who hold shares in the company.

Givaudan gives you experienced help in perfuming men's toiletries

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The market for men's toiletries is a live, growing market . . . rich with opportunities for smart promotion. And the key to this market is fragrance . . . fresh, original scents that rouse masculine interest and respect, and stimulate men's natural pride in better grooming.

Givaudan has developed many fragrances that meet the challenge of this market . . . and we are prepared to help you develop special new scents that heighten and broaden the appeal of your products. We are also prepared to give you experienced counsel in solving any perfuming problems that may arise in the use of aerosol mediums, polyethylene containers and other packaging materials.

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Better Perfume Materials Through Constant Research and Creative Ability

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Strong Cobb Arner of Canada, Ltd. Formed

Strong Cobb Arner Inc. is consolidating the operations of its two Canadian affiliates into a single subsidiary at Fort Erie, Ontario. To be known as Strong Cobb Arner of Canada, Ltd., it will absorb The Arner Co., Ltd., of Fort Erie, and Strong Cobb of Canada, Ltd., and will be located at the Fort Erie plant. All product and process development of the parent company will be available from the new Canadian plant and laboratories.

The Montreal facility, the smaller of the two, will be closed and operations transferred to Fort Erie over a period of several months, under the direction of Walter Morris, Montreal production manager.

The board of directors of the Canadian subsidiary will include Dr. Niels C. Klendshoj as chairman, John N. Eustis, president of Strong Cobb Arner, Inc., and L. Peter Candler, Montreal industrialist.

The expanded services at Fort Erie will make available a nearly complete range of pharmaceutical products and dosage forms—all standard compressed and coated tablets, dry-coated and layered tablets, mass and pulvis pills, hard-shell capsules, veterinary products including boluses and bellows-type mastitis syringes, all forms of powders, granulations, and liquid, cream, and ointment preparations.

Continental Can Opens New Plastic Bottle Facilities

Following the creation of its Plastic Bottle and Tube Division last January, the Continental Can Company has announced the setting up of plastic bottle production facilities in Los Angeles, Baltimore, and Cincinnati, to supplement the production of its present Chicago plant.

All of the new lines will make custom-mold bottles in sizes up to and including 32 ounces. The West Coast will be serviced by plastic bottle lines in the flexible packaging plant in South Gate, Los Angeles, California; the Baltimore plant, on Quad Ave., and the Cincinnati plant at Blue Ash Road and Emerald Ave. in Rossmoyne, Ohio, will service the eastern and mid-west, starting in April.

Givaudan Gets New Chicago Address

The Chicago office of Givaudan-Delawanna, Inc., and its associate companies, Givaudan Flavors Inc., and Sindar Corporation, have moved to new and modern quarters at 6778 Northwest Highway, Chicago 31, Ill.; telephone, NEcastle 1-9090.

Some of the more than 350 executives and employees of H. Kohnstamm & Company, Inc., celebrating the company's 110th year at a dinner recently held in the Robert Treat Hotel, Newark, N. J. Keynote address was presented by Paul L. Kohnstamm, president, and awards for length of service were made to 30 employees, some of whom have been with Kohnstamm for more than 50 years.

Union Carbide Revising Texas Facilities

Union Carbide Chemicals Company has awarded a construction contract for altering and revising the plant facilities at Brownsville, Texas, with completion expected early in 1961.

Among the chemicals to be made at Brownsville are acetic acid, acetic anhydride, and methyl ethyl ketone. These will be made in large quantity for the chemical, pharmaceutical, and textile industries.

The plant in Texas is on a 309-acre tract near Brownsville, which is leased on a long-term basis from the Brownsville Navigation District.

Henry D. Coons, plant manager of the new project, has announced the appointment of R. D. Bower as assistant plant manager. Mr. Bower was formerly at the New York headquarters of the Union Carbide Chemicals Company's production group.

Revlon Buys Pinex Company

Revlon, Inc., has purchased Pinex Company, Inc., which has headquarters in Fort Wayne, Inc., and Pinex Company Canada, with headquarters in Toronto.

The two Pinex companies manufacture cough syrups and tablets and other products sold in drugstores and supermarkets in both the United States and Canada.

The two corporations will be integrated into the operations of Revlon's wholly owned Thayer Laboratories, established for development and manufacture of proprietary drugs. The present organizational structure and manufacturing operations of the two Pinex firms are to be continued.

Colgate-Palmolive Aquires Chicago Company

The Colgate-Palmolive Company has acquired the S. M. Edison Chemical Company, Inc., of Chicago, by means of an exchange of stock.

Edison's principal product is Dermassage, a medicated body lotion used in hospitals and also sold through retail outlets, and surgical instrument cleansers and other specialty products.

The company is expected to continue to operate along present lines, as a wholly owned subsidiary, with the founder and president, Dr. S. M. Edison, in continued association with it.

Two Celebrate 25 Years With Fritzsche Brothers

Fred W. Richter, who joined Fritzsche Brothers, Inc. on March 18, 1935, and Arthur Hemminger, who began one week later, recently participated in a joint lnucheon celebration at the Charles Restaurant in honor of their 25th anniversary with the company.

Mr. Richter is manager in charge of manufacture at the Clifton plant, and Mr. Hemminger is personnel manager anad assistant secretary.

At the luncheon, each received an embossed scroll and a Government bond, as well as gifts from their fellow employees.

Convened in New York to discuss the sales and distribution of the new Glidden aromatics, inexpensive adjuncts to perfumery, are, left to right: Charles C. Bryan, president of Firmenich, Incorporated; Dr. W. D. Stallcup and R. L. Webb, both of Glidden Company; Clive N. Ross, Firmenich West Coast manager; J. B. Bauernfeind of Glidden; and Charles H. Milton of Firmenich.

Glidden Aromatics Discussed

Charles C. Bryan, president of Firmenich, Incorporated, recently convened in New York to welcome Clive N. Ross, Firmenich West Coast manager, Dr. W. D. Stallcup, R. L. Webb, and J. B. de Bauernfeind, all from the Glidden Company, to discuss the sales and distribution of the new Glidden aromatics, which are inexpensive adjuncts to the perfumery art.

Ungerer's Branigan Goes Round the World Again

Last year George Branigan of Ungerer & Company visited the Far East where he was in touch with producers of raw materials, to discuss quality requirements. On April first, with a new itinerary, he left for Hawaii, New Zealand, Australia, The Bourbon Islands, South Africa, Kenya, Ethiopia, Egypt, and Spain, among others near these stops.

West Chemical Acquires Vitarine Company

West Chemical Products, Inc., Long Island City, has acquired for an undisclosed amount of cash, the business assets and good-will of the Vitarine Company, Inc., New York, and its subsidiaries in the field of manufacturing, packaging, and distribution of drugs and allied products.

The acquisition means national distribution facilities for Vitarine products through 59 West Chemical warehouses and sales offices in principal cities in the United States and Canada.

West expects to continue the business and policies of Vitarine without change, and the management will continue in their present capacities.

Eaton Medical Department Expanded to Three Divisions

The medical department of Eaton Laboratories has been expanded to three divisions, according to Dr. Paul F. MacLeod, medical director. The units are now clinical research, medical research and professional services, and medical research—international division.

Dr. Paul Christenson has been appointed director of clinical research, and the staff consists of Drs. Charles Tracy, Paul Kearns, and Max Davis. Two Norwich physicians, Drs. Philip Aronson and Richard Hosbach, are to serve as consultants.

Dr. Paul Newland has been named director of medical research and professional services, with Drs. Myles Miller and Eric Mueller on his staff.

Dr. J. M. Amberson is director of the newly formed medical research-international division.

Prior to joining Eaton in 1953, Dr. MacLeod was assistant professor of medicine and director of the student health service at the University of Missouri. Dr. Christenson was in private practice and served as a captain in the U. S. Air Force Medical Corps from 1947 to 1949. Dr. Newland was an internist in private practice, and a member of the medical department of Procter & Gamble Company. Dr. Amberson, Captain, MC, U. S. Navy (Ret.) is a consultant in preventive medicine to the Navy and a member of the Expert Committee on Plague, World Health Organization, in Geneva, Switzerland.

Kintner to Address Cosmetic Career Women in April

The Honorable Earl W. Kintner, Chairman of the Federal Trade Commission, will be the guest speaker at the men's day luncheon of the Cosmetic Career Women, to be held April 19th at the Waldorf-Astoria, New York City. His subject, Truth in Cosmetic Advertising.

Helene Curtis Buys Studio Girl—Hollywood

Helene Curtis Industries, Inc., has acquired all the assets of Studio Girl-Hollywood and Studio Girl of California.

The acquisition was made for cash, and the company will operate independently as a wholly owned subsidiary of Helene Curtis.

Ordine C. Ferris

Ordine C Ferris, purchasing manager for Schering Corporation, died at Mountainside Hospital, Monclair, N. J., on March 25, after a brief illness. He was 58.

Mr. Ferris joined Schering in 1938, and three years later was named to the position he held until his death.

He was a member of several professional groups, including the Packaging Institute and the National Association of Purchasing Agents. He had been secretary of the Chemical Buyers Group of the N.A.P.A.

Albin Wilko

Albin Wilko, a flavor chemist in the eastern laboratory of Fries & Fries Inc., died on February 29. He was 48 years old.

A veteran of the industry, Mr. Wilko had worked for more than a quarter of a century as a perfume and flavor chemist.

Gordon O. Cragwall

Gordon O. Cragwall, director of the technical service department for Chas. Pfizer & Co., Inc., until 1953, died on March 28 in Garden City, New York.

Mr. Cragwell was one of the founders of the Commercial Chemical Development Association, and served as its secretary for several years. He was also an active member of the American Drug Manufacturers Association.

MEMO TO:
White Oil and Petrolatum Users
PENN-DRAKE TECHNICAL SERVICE always is at YOUR SERVICE
. . . to help you make a good product better—or to provide valued assistance in the solution of your problems. May we consult with you on any White Oil or Petrolatum application?
penn drake products

PENNSYLVANIA REFINING COMPANY

BUTLER 30, PENNSYLVANIA

BRANCHES: CLEVELAND, OHIO AND EDGEWATER, N. J.

(*Continued from page 467*)

ful one. Fortunately, our hunch was confirmed in therapeutic trials.

Chlorpromazine's distinctive behavioral action struck Dr. Fellows when he carried out his initial dose-range studies. He noticed that rats given chlorpromazine were quieted, but, unlike rats slowed down with barbiturates, would scamper off when touched. Dr. Fellows thought that at last he had found what he began looking for in 1946. In fact, he had found more than he had ever dreamed of for his anticaffeine compounds. Brief but significant therapeutic trials were made by Dr. William Long, SK&F's medical director, in five disturbed patients. They confirmed the fact that a new kind of calming agent was in hand. But full confirmation of this finding came only many months, and many hundreds of thousands of dollars, later.

There is far more to this story; suffice it to say that the development of Thorazine took a distinctive turn because of what SK&F decided to do with it. It has come to be a standard of reference for potent antiemetics and potent tranquilizers, as well as the progenitor of an already large and still growing family of useful drugs.

You see how unpredictable research can be. What later proved to be an extraneous interest—barbiturate potentiation in this case—led to the development of drugs that, for completely unexpected reasons, turned out to be major breakthroughs in medical science.

There's a postscript to this story. SK&F #525, the therapeutic failure that led to so much therapeutic success, came off the shelf again about two years ago. Because pharmacologic studies had shown that it interfered with the metabolic breakdown of certain drugs, one of our biochemists wondered if it might modify the metabolism of cholesterol. It did. In fact, two years of animal experiments showed that the compound significantly lowers cholesterol levels in hypercholesteremic rats and dogs, and we again had high hopes for it—hopes that were again shattered. Chronic toxicity studies revealed that it also can cause liver damage. Once more, SK&F #525 had failed. It is once more back on the shelf. Will this latest failure eventually lead to some new success? Perhaps not, but I wouldn't bet against it.

Sometimes, on the other hand, we shelve products that work.

The Case of the Murdered Drug

This is the story of a potent antiemetic and antipsychotic that, although it successfully passed all laboratory and clinical trials, was "killed" before it could reach the market. It's the story of a new phenothiazine born in Paris, selected as a most promising compound from a large series of active phenothiazines. We started study in 1957. Animal tests showed the compound SK&F #5883 to be so potent an antiemetic that its anticipated effective dose in man could be measured in micrograms. Clinical trials by experienced investigators brought enthusiastic reports of the drug's extraordinary antiemetic properties. It controlled severe vomiting in some patients who had not been successfully treated with other available agents. The American psychiatrists who studied the drug reported that it was also a potent antipsychotic. Though these psychiatric studies were limited in number, their results corroborated those of French psychiatrists.

SK&F #5883 was also studied as an antiemetic by a hundred internists in general practice and again, proved an excellent antiemetic. The results obtained in this general practice setting however, though somewhat better than those obtained by similar drugs, were not (we felt) *significantly* better. Besides, one predicted advantage of the drug never materialized; it was not, in its usual doses, completely free of the annoying side effect that occasionlly occurs with other potent phenothiazines—palsylike extra pyramidal symptoms.

Nevertheless, we had a good drug. No mistake about that. A drug as good as, sometimes apparently better than, anything on the market. But, in the opinion of our clinical staff, "as good as" wasn't good enough. SK&F #5883 was "killed." This decision, by the way, was not universally applauded. Some of our investigators heartily disagreed with it, as did our French colleagues who felt more strongly than we about the drug's distinctive value in psychiatry. Our research and development costs? Can't say accurately, but about three quarters of a million dollars.

Perhaps this story—a common one in the pharmaceutical industry—will help answer the charge that the industry commonly recovers research costs by foisting compounds that are little different from others upon physicians, just because they are new.

Now it's true that, since the introduction of chlorpromazine as Thorazine, a large number of related compounds have been marketed, just as we might have marketed SK&F #5883, had we taken the advice of some well-qualified experts. If we had, we'd have marketed it in the sincere belief that it would have been a valuable contribution to medicine. Perhaps we were wrong in not doing so. We've made mistakes before—as the following "case" shows.

The Case of a House Built on Sand

A little over ten years ago, several biochemists including SK&F's Dr. Arthur Heming got the idea that ion exchange resins, then used as water demineralizers, might be adapted to remove excessive salt and water from patients with edema.

We got a special grade of resin from Rohm and Haas, converted it to what we thought was a suitable form. Animal tests indicated that we had a safe and extremely effective agent. The first clinical trials showed that, while the product was undoubtedly

(*Continued on page 548*)

Management Forum

BY FRANCIS CHILSON
INDUSTRIAL CONSULTANT

Overproduction?

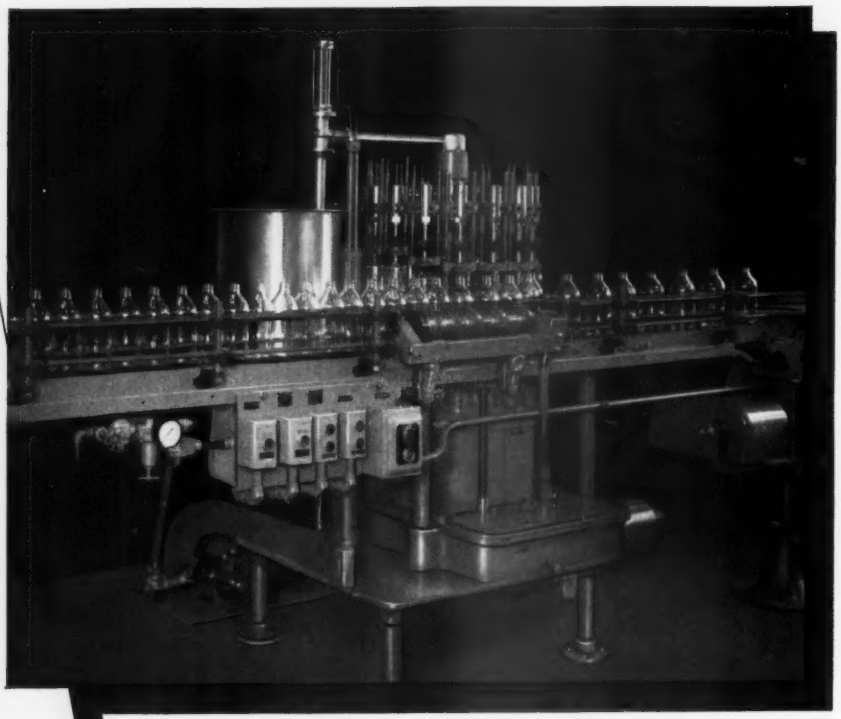
Every now and again calamity-howlers scream that the country is going to the dogs because we are over-producing wheat, steel, oil, textiles, aluminum and a few other basic commodities. If this country goes to the dogs it will not be because of the overproduction of *any* commodity; it will be because of the under-production of philosophers, scientists, teachers, engineers, poets, intellectuals, doctors, nurses and other professionals and scholars. Actually we've never had over-production of anything, save possibly wheat; we simply have over-priced everything. The law of supply and demand has been interfered with, as Veblen pointed out forty years ago, by the investment bankers through their insistence on the highest possible return for stockholders, and their fear that lowering prices will instantly reduce dividends.

Some commodities are of course unaffected by prices (within limits that is), because markets exist for definite amounts of these commodities and consumption of them could not be increased substantially even if they were given away. Take insulin, for example. The market for this product is determined by the total number of diabetics. Beyond this amount the market for insulin cannot be increased unless of course new uses are discovered for it. There are many drug products in the same category (a fact which should have been pointed out to Kefauver). But insofar as basic commodities that affect the whole economy are concerned, we have never had a time, not even during the war, when the industrial plant of this country could run wide open. I don't think we need have had over-production even of wheat. We have had under-consumption. When in my travels I see poor people everywhere, I can't believe that we would have a wheat surplus if these people could buy a decent loaf of bread without having to pay a quarter or more for it. I realize there are transportation costs to be taken into account. I also realize that many transportation costs stem right back to the policies of a consistently stupid Interstate Commerce Commission. I am aware of the fact there are many co-operative practices that manufacturers in various industries could adopt and thereby cut costs if it weren't for the Federal Trade Commission and the anti-trust laws upon which it is based. These laws were necessary, when enacted, to stop the plunder of the public, but now they are too inflexible and too limiting for a burgeoning economy. Commerce courts should be established so that manufacturers could appeal to them for permission to cooperate in devising ways of reducing costs and prices without being accused of conspiracy to limit trade. If we could operate our plants really at maximum capacity I don't think stockholders or bankers need ever worry about dividends, nor do I think we'd need to worry overmuch about high wages.

In my opinion our great, over-riding, national problem is, however, not over-production of anything but rather under-production of trained brains. More than ever we need trained brains to solve, among many others, the problems of production, distribution and pricing. I was delighted therefore when Dr. Grayson Kirk, President of Columbia University, advocated, in the March 26th *Saturday Evening Post*, increasing the length of the college year to forty-five weeks from the current thirty-two so that college courses can be completed in three instead of four years. I have favored this plan for years, and in fact, wrote an article in this column a couple of years ago recommending that high schools as well as colleges adopt a full year program to utilize fully the school plant that is already available. We can never overproduce trained brains and, when we get enough of them, the production and pricing problems that beset us now will be worked out.

Note on New York

Friends in England will be interested to know that part of New York City is built on English soil.



MEMO

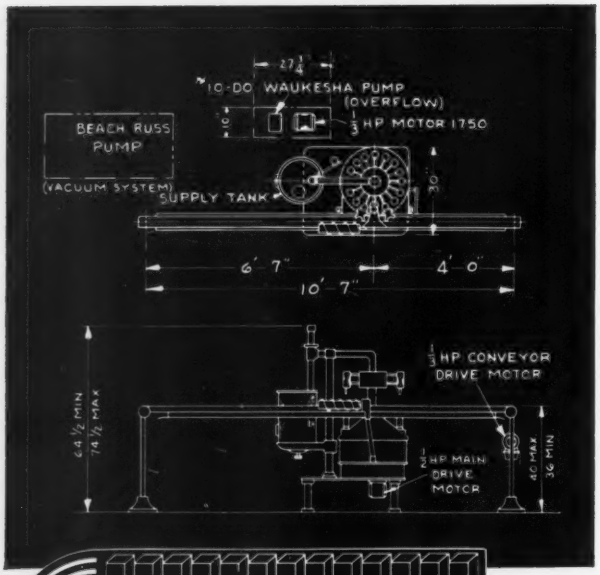
To: J.T.C.

This looks great— let's get all the facts— K.P.

PNEUMATIC "ALL-PURPOSE" FILLER

DOES ABOUT ALL YOU COULD ASK

in the line of liquid filling



Pick your filling method—vacuum, pressure or gravity principle. You can use any one, or any *combination*, with this machine. It handles liquids or semi-liquids of all types—open mouth or sprinkle top, containers of glass, metal or plastic. And its 16 heads do the job at speeds up to 180 per minute. Similar larger models are available for speeds ranging to 300 containers per minute.

Easy maintenance is another great feature of this machine. Besides quick interchangeability of parts and simplicity of adjustment, the open construction allows ready cleaning without disturbing mechanism.

Write for complete information.

PNEUMATIC SCALE CORPORATION, LTD., 73 Newport Avenue, Quincy 71, Mass. Sales Offices: *New York; Chicago; Dallas; Rochester.* Agents: *Fred Todt Company at Los Angeles, San Francisco, and Seattle. Rockwell Pneumatic Scale Ltd., Edgware Road, London, N. W. 2, England, O. R. M. A., Paris 8, France. Carbert Manufacturing Co. Division, Cambridge, Mass., Delamere & Williams Co., Ltd., Toronto.*

★ PNEUMATIC *Packaging and Bottling Equipment*

About a mile below the United Nations Building, where a foot bridge crosses the East River Drive, there is a bronze placque set into the bridge support bearing the following inscription:

"Beneath this East River Drive of the City of New York lie stones, bricks and rubble from the bombed city of Bristol in England . . . brought here in ballast from overseas, these fragments that once were homes shall testify while men love freedom to the resolution and fortitude of the people of Britain. They saw their homes struck down without warning . . . it was not their walls but their valor that kept them free."

The section of the East River where the rubble was dumped is called Bristol Basin.

Making Meetings Effective

We have to attend so many meetings in business, in social and political life that we should all know and insist that correct rules of parliamentary procedure be followed. Otherwise meetings tend to degenerate into gab fests or disintegrate into futile, time wasting rows. I recommend a study of Roberts Rules of Order, Revised. Following strict parliamentary procedure may seem a little too formal but observance of the rules keeps the meeting from becoming merely an aimless talk fest.

Industrial Education

It is depressing to me to find so few companies with general libraries or book clubs for the use of all their employees. Fewer still make a consistent effort to improve the education of employees. It seems to me that every personnel director should also be an education director. Every employee should get every week a booklet written in clear, concise English dealing with some phase of education: history, politics, economics. The world is full of inspirational works which can be quoted. I don't mean in the sense of sloganeering. Every plant is festooned with posters embellished with catchy slogans which, in my opinion mean very little. I mean little publications similar to those published by the Christophers, each dealing with a single topic. I recall the golden hours of my youth reading Elbert Hubbard's *Little Journeys to the Homes of the Great*. Short, clear, interesting. As a supplement, the plant radio might be used daily for short poetry and essay readings. Discussion groups and essay contests should be promoted. This year many companies will publish circulars and booklets urging people to vote. These publications usually appear just before election. They should start right now and they should explain why people should vote, not only in national elections, but in all elections. It should be made clear to people why their own and their family's present and future interests depend on their exercise of their own voting power. With as little prejudice as possible, issues involved in the elections should clearly be stated pro and con. We should do everything possible to help people improve themselves and we should show them how in so doing they automatically help others. We should do everything possible to explain all aspects of our business so that people will come to feel they are part of it and not something apart from it. Factories should be schools.

What of the Future?

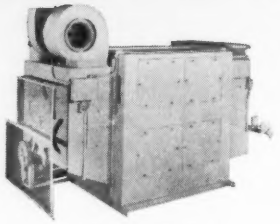
Investors in the pharmaceutical industry often ask: What of the future? Can the pace of the last fifteen years be maintained? These questions are of interest too to every person employed in the industry from presidents to porters. Their futures are more intimately tied up with the industry than any others. In my contacts with the financial community I always give to these questions the same answer: In my opinion we have just started. In spite of the miracle drugs, we haven't got disease licked yet—not by a very long shot. Just when we think we have one disease under control mutants develop and the battle is joined again. This is particularly true in the field of virology, because for some reason viruses seem to possess the ability to change their characteristics—to mutate—much more rapidly than bacteria. Not only do viruses mutate but each class seems to contain, not one or two, but dozens of different types. For instance, in the adenoviruses group, 27 different strains have been isolated.

Just when the going seems to be smooth something like hepatitis pops up and raises hell, or else Eastern Equine Encephalomyelitis, which killed a bunch of people in New Jersey last summer. A number of diseases have been brought under reasonable control. Our industry is the only one, I believe, in the world which annually spends a king's ransom in research dedicated to killing off its own business. But because Nature is tough and has a way of fighting back unexpectedly, tens of years of research will be required before the major diseases will be brought under control and they will have to be brought under control all over the world. In the meantime there's a whole world of animal and plant diseases to fight, and, overriding all, means must be developed for controlling populations and for increasing food production. It seems to me that the pharmaceutical industry will continue to be in a very thriving state for the next century or two.

Four-Way Pallets

I'd like to hear from anyone who has had experience with 4-way pallets. As you doubtless know these pallets are designed so that fork trucks can enter them from any side. Of course they should really be called 2-way pallets because all pallets can be entered from opposite ends. I have never used these so-called 4-way pallets and I should think that because of the spread of the stringer-blocks they would be limited to rather light loads. If any of you use them please drop me a line. The cost of pallets

Tableting machines don't clog when workrooms are desert-dry

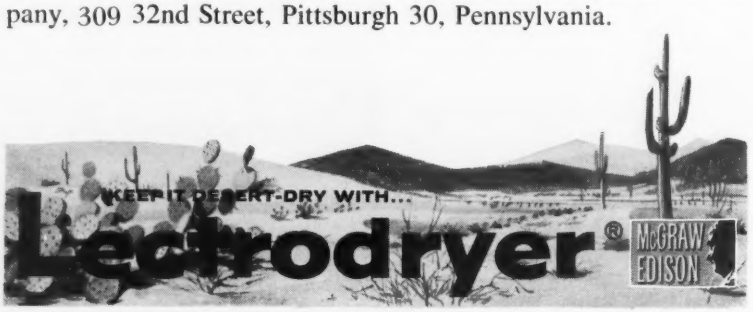


New Type CH Lectrodryer

A CHO Lectrodryer maintains the 15,680 cubic foot area of this tableting room at 20% relative humidity, regardless of conditions out-of-doors. So, when humid weather ordinarily causes hygroscopic powders to gum up and stop flowing, production is maintained here at full speed.

Have you, in the past, considered controlled dryness and found it too costly? It may pay to reopen those files and ask Pittsburgh Lectrodryer for drying recommendations. Dehumidification methods and efficiencies of dryers have been developed so much recently that the cost picture may be completely changed.

DATA SHEETS ARE AVAILABLE which describe typical humidity control installations. They'll serve as guides in planning your own systems. For copies and for other drying help, write Pittsburgh Lectrodryer Division, McGraw-Edison Company, 309 32nd Street, Pittsburgh 30, Pennsylvania.



is increasing steadily, hence, when used in quantities of several thousand, the pallet inventory becomes something to reckon with. The big glass companies have developed means of stacking large loads of empty bottles by using wide-arm side grabs and also by using the bottom cartons in such a way that their opened flaps form in effect a pallet deck and a whole stack can be picked up by a fork truck. Very large pallets also are being used but suffer the deficiency that they cannot readily be handled when empty excepting by fork truck. Usually these very large pallets are used for stocks that are held for a considerable period of time. I've had a lot of ideas for improving pallets; the trouble is that they cost too much to build.

Thought for Today

The hell of recreation is that you have to work so damn hard to pay for it.

Certification Laboratory

Some time ago I mentioned the need for a certification laboratory to reduce the amount of time wasted in repetitious control work on identical batches, which are split among several purchasers in the ordinary course of buying chemical supplies. I was thinking of the innumerable times when a batch of chemicals is approved routinely by the chemical manufacturer's control laboratory and then sold piecemeal to many users, each of whom repeats the chemical assays before using the stuff. I, of course, was thinking of the drug manufacturer's problem without realizing that the problem affects individual research people and drug retailers too. Shortly after the note appeared, I got a letter from Dr. William N. Heller of the University of Arkansas Medical center, in which he wrote:

"As always your column in the November issue of DCI was stimulating. More power to you in your advocacy of a certification system for raw materials.

If there is anything I, as one of the 3,000 members of the American Society of Hospital Pharmacists, can do to help, let me know. In the old days we could order our chemicals from Merck or Mallinckrodt and have no doubts. With the need to purchase small lots of newer organic medicinals from firms with which we have had no previous contact, we are in a quandary. Often we need these chemicals for a research project, if not for patient care. In either case their reliability should be unquestionable.

Until a certification system is established, if ever, have you any suggestions for the man who has to depend on the supplier's integrity?"

Dr. Heller's letter raises a lot of questions. With the plethora of powerful and often dangerous chemicals of which modern medicines are compounded, one wonders whether the time hasn't come to stop compounding prescriptions, excepting for branded, prepared products, in retail pharmacies. No one can expect the retail pharmacist to check the quality of all the medicinals he buys for compounding purposes. He lacks the training, the time, and the money to pursue such a practice. And, anyway, damn few doctors are capable of writing trustworthy prescriptions, excepting for prepared medicines. But as long as the practice of compounding prescriptions from original medicinals continues, certified medicinals w o u l d enormously help those retail pharmacists who do not buy on price and are genuinely interested in the integrity of the materials they employ in compounding prescriptions.

The problem in hospital pharmacies is different from that of retail stores. In the larger hospitals, at least, a lot of clinical work is going on and a lot more experimentation must be done in the hospital pharmacies than in any other type of pharmacy. The position of the hospital pharmacist is similar to that of a pharmaceutical chemist in a research organization. In the latter instance the research man has the facilities and the time to check the materials he uses. In both cases certification would save a lot of time and money. Of course, certification cannot be applied straight across the board because there is no agreement on methods of assaying some products. This is especially true of chemicals of animal origin.

Very often chemicals that pass the routine tests for identity and purity established by their manufacturer contain traces of foreign matter that raises hell with the end use of the chemicals. This foreign matter may originate in the equipment and handling methods of the chemical manufacturer, and go undetected by his control chemists whose sole purpose is to make certain that the product sample conforms to the specifications established for it. I've run into hundreds of cases of stray contaminants. But if we had a certification laboratory, its procedures would be set up from the point of view of the chemical user and not the chemical makers and these contaminants would very likely be detected. One thing is certain: if we had a certification laboratory, an army of chemists could be transferred to more important work.

Overseas Selling

In traveling about the world I have been impressed with the number of dinky little plants built by American pharmaceutical companies all over the map. If American companies really want to exploit the foreign market properly, it could be done through combined, instead of individual manufacturing efforts. Under this plan large, efficient plants could be built to serve a variety of independent marketing companies. It goes without saying that whenever possible local capital and local labor should be employed. Here's a wide open field for contract manufacture such as is conducted in this country by Strong Cobb Arner Inc. and other firms. On the other hand there is no reason why a group of American companies should not pool their manufacturing

KIEFER NEW DEVELOPMENTS

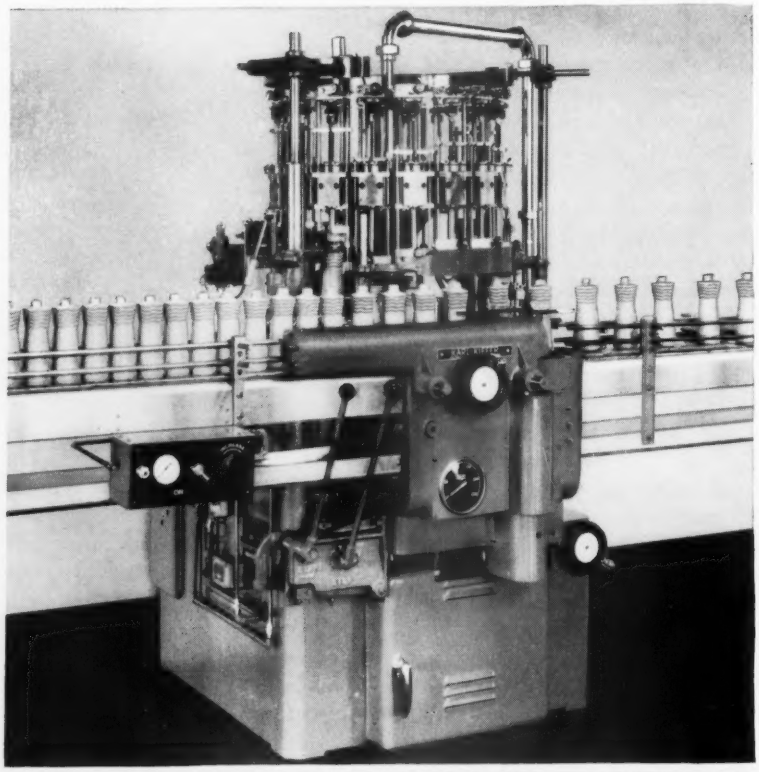
Ahead of the Times!

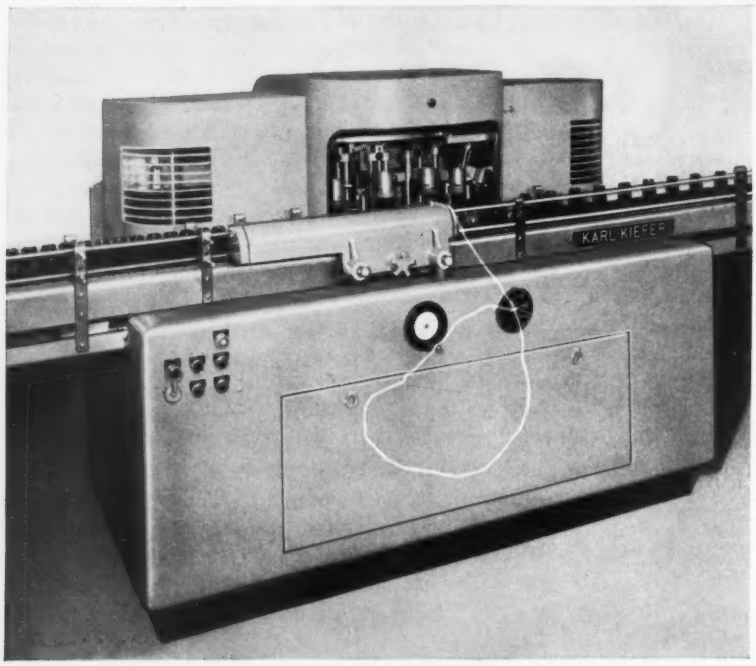
KIEFER

"PIN-POINT"

PRESSURE-VACUUM FILLING MACHINES

Fill containers WITHOUT the use of a SEAL. Amazing accuracy in plastics as shown, also the F style or #10 tins. Any speed that you desire. KIEFER'S MIRACLE INVENTION. Details available for you . . . write us today.





KIEFER

BOTTOMS-UP BOTTLE CLEANER

Takes bottles from conveyor in a very smooth, rotary motion. Containers are first inverted, then receive a stout blast of filtered compressed air. Uninterrupted production; no banging, no crushing of glass. Handles bottles as small as a fraction of an ounce or large as a quart. Up to 300 a minute.

The Karl Kiefer Machine Co. 932 MARTIN STREET • CINCINNATI 2, OHIO

NEW YORK • BOSTON • CHICAGO • SAN FRANCISCO • PHILADELPHIA • TORONTO • HOUSTON • VANCOUVER • SAVANNAH • LOS ANGELES • LONDON, ENGLAND

efforts in a jointly owned manufacturing company. Foreign selling is getting tougher every year. Therefore cooperative manufacture and cooperative credit would help lower costs and enable you to extend credit terms comparable to those offered by the Germans and Japanese.

Multiple-Stroke Filler Attachment

A multiple-stroke attachment produced by the National Instrument Company, 2701 Rockwood Ave., Baltimore 15, Md., extends the range of liquid fillers 19 times. With this attachment, the company's Filamatic Model DAB-16 would be capable of filling containers up to 2½ gallons in size, and larger containers could be filled by re-cycling the Filamatic twice or more.

The unit is an automatic reset, predetermining counter, which can be present for any number of cycles up to 19, depending upon the volume of liquid to be dispensed. A foot switch initiates the filling cycle; it stops automatically.

Semi-Automatic Wrapping Machines

Two new low-cost, semi-automatic machines for all-purpose wrapping of up to 15 packages per minute are available form the Elgin Manufacturing Company, Elgin, Illinois. One, the EZB, handles polyethylene and other limp films, is motor-driven, operates from a foot-treadle control, and is fully adjustable for underfolding, overwrapping, and heat sealing by the turn of a handle. It is especially recommended for economical and limited production of rectangular products, cartons, and flat packages.

The second, the EZA, is designed to handle cellophanes, foils, and waxed paper.

Paper Shredders

The Industrial Shredder and Cutter Company, 707 South Ellsworth Avenue, Salem, Ohio, has issued a catalog describing its full line of automatic paper shredders, illustrating all models in actual situations from office applications to industrial crusher and shredder installations. Reference charts give immediate applications of each model. capacity, speed, weight, dimensions, and mechanical and electrical drive detail.

High-Speed Rotary Pocket Filler

A new liquid filling machine designed to handle lightweight plastic or glass, and odd-shaped containers with maximum speed, has been introduced by the MRM Company, Inc., 191 Berry St., Brooklyn 11, N. Y. It has broad application in filling of colognes, lotions, perfumes, and a wide range of liquid cosmetic and chemical products.

Easily adapted to any production line operation, the MRM Rotary Automatic Pocket Filler is capable of speeds up to 200 per minute without toppling and spilling, and can be switched from vacuum, gravity or pressure operation, by a change of nozzles.

Restriction Plug Inserter

High-speed insertion of restriction plugs for non-pressurized, soft plastic spray containers is accomplished as part of a conveyorized production line operation by a new machine developed by Resina Automatic Machinery Company, Inc., 572 Smith St., Brooklyn 31, N. Y. The unit, the Model PB Restriction Plug Inserter, is a fully automatic, straightline machine with vari-speed drive that permits integration into existing production lines at speed up to 120 minutes and higher.

Operation on a continuous-motion principle, it grips containers by the neck to prevent collapse of soft plastic bodies, inserting plugs automatically. Plugs are hopper-fed, and the machine has a no-container, no-plug control. The straight-line operation guarantees against spilling or toppling. Equipped to handle a full container and plug range, changeovers take about 15 minutes.

Nozzle-Bowl Centrifuge

A nozzle-bowl centrifuge for high-pressure, high-temperature operation has been announced by The De Val Separator Company, Poughkeepsie, New York. The QX-312 centrifuge concentrates solids, clarifies liquids, or classifies solid particles, and can handle up to 450 gpm at temperatures to 300° F. and pressures to 125 psi.

The bowl meets standard pressure requirements, and necessary connections on the top and bottom cover are pressure-tight to allow continuous high-pressure operation. Clarified effluent is discharged by a paring device that functions at a pressure differential up to 50 psi over the operating pressure. Solids discharged from nozzles flow by gravity from the vented sludge port.

The degree of concntration can be varied. The bowl speed can range from 3600 to 4700 rpm. The bowl spindle is driven by a direct V-belt drive. The motor operates at 1750 rpm, and develops from 40 to 100 hp. depending on the material flow through the unit and the pressure requirements.

Pressure Burette for Aerosols

Aerosol Machinery Company, 80R Magnolia Ave., Westbury, Long Island, N. Y., has added to its line of aerosol machinery the AMCO Pressure Burette for injecting propellant into aerosol cans. Hand-operated, it is designed for small runs and laboratory work. It is portable, 30 inches high, and has a heavy, solid aluminum base that prevents toppling. The injector valve has easily changed adapters, all parts are highly corrosion-resistant, operating controls are table height. A shatter-proof clear plastic shield enclosing the tube provides maximum protection for the operator.

Calibrated in 5 cc. gradations, the unit has a capacity of 1000 cc. which eliminates frequent refilling. It is available for use with nitrogen at small extra cost.

▲ A multi-layer tabletting machine—Model 566—is used to form a three layer aspirin—TRIPISIN.

◀ Stokes Model 533 produces 900,000 throat lozenges during a ten hour working day.

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STOKES

Trade Literature

Water-Soluble Resin

The B. F. Goodrich Chemical Company, 3135 Euclid Ave., Cleveland 15, Ohio, has issued a 24-page booklet providing technical and formulating information on Carbopol 934, a thickening, suspending, dispersing, and emulsifying agent. Also available are seven supplements to this bulletin, which describe specific applications of Carbopol 934, and complementary resins, Carbopol 940 and 941.

Aluminum Closures

Aluminum Company of America, 731 Alcoa Building, Pittsburgh 19, Penna., has released a 40-page, color-illustrated booklet describing its aluminum closures for a wide range of bottled products, including pharmaceuticals, cosmetics, and toiletries. Alcoa Aluminum Closures includes descriptions of colored and decorated closure possibilities, types of cap lines, and a long list of specialty items as well as sealing machines.

Corn Oil

Corn Oil is the title of the second edition of a 20-page booklet published by the Corn Industries Research Foundation, Inc., 3 East 45th St., New York City 17. Illustrated with photographs and charts, it describes the uses of corn oil, including those of a carrier for vitamins and other medicinal preparations, and soap stock; its manufacture; characteristics; packaging; storing; and handling.

Surfactants

A 24-page catalog of surface active agents has been published by the Onyx Oil & Chemical Company, Jersey City 2, N. J. Each product is described by trade name, active ingredient, percentage of activity, its physical state, general use, specific applications, and properties. The chemistry of each of the three general classes into which these products can be divided—anionic, cationic, and nonionic—is described.

Filling Equipment

Arthur Colton Company, 3400 E. Lafayette, Detroit 7, Mich., has published an eight-page, three-color, illustrated catalog describing Colton, Colton-Hope, and Colton-Alpha filling equipment for the pharmaceutical, chemical, and cosmetic industries. Aerosol filling machines are included.

Printing on Polyethylene

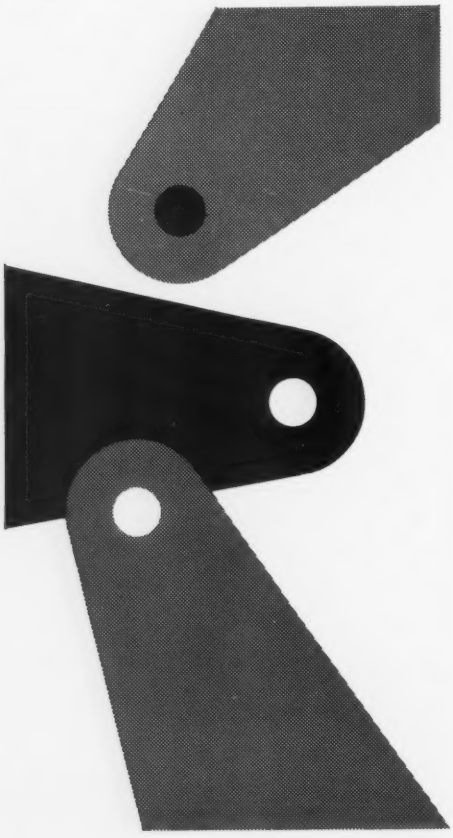
A 16-page bulletin, Printing of Polyethylene, is now available from U. S. Industrial Chemicals Company, 99 Park Ave., New York City 16. It provides technical data on treating polyethylene film for printability, printing methods, inks, field test methods, and a glossary.

Fine and Technical Chemicals

A Price Schedule of Fine and Technical Chemicals has been issued by B. L. Lemke & Company, Inc., Lodi, N. J.

Vanicide BN

The bulletin on Vanicide from R. T. Vanderbilt Company described in our March issue is titled Vanicide BN.



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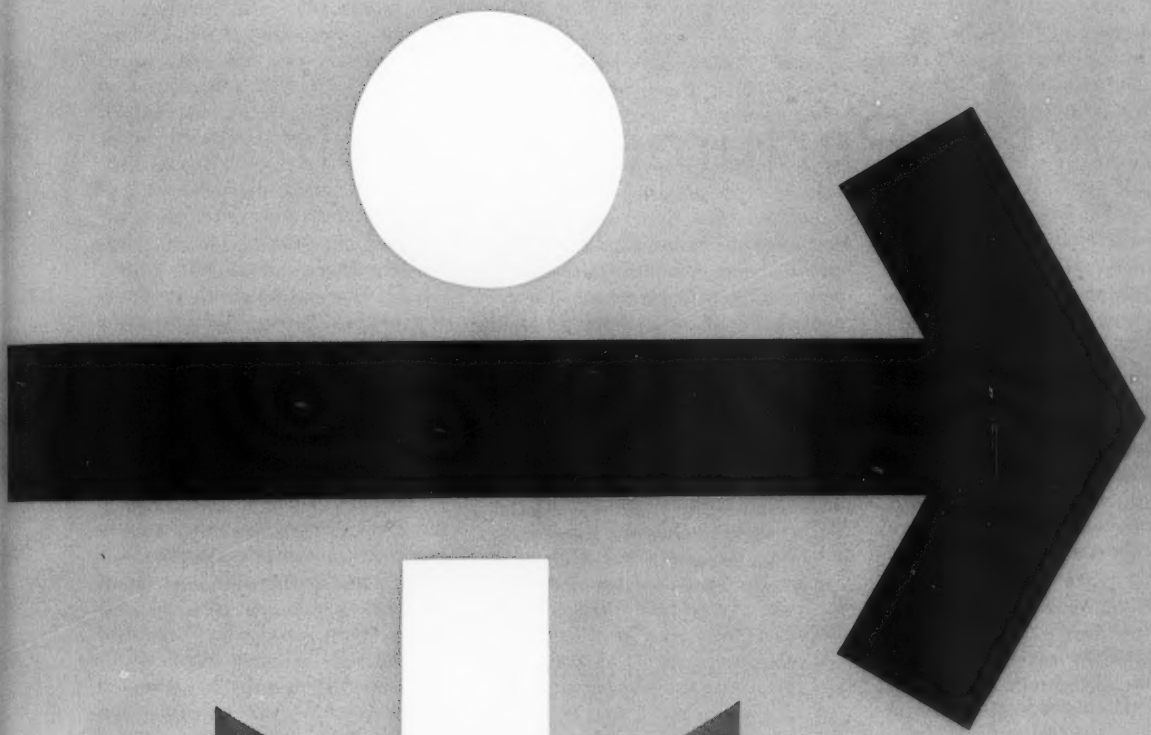

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Perfumer's Shelf

Bergamot Oil

The constitution of bergamot oil is more complex than had hitherto been imagined. Although the olfactory note is dominated by linalyl acetate and linalol, which together represent 60-70 per cent of the essential oil, and the intensity of the odor is in relation to the concentration of linalyl acetate, there are nevertheless other substances which, even in small quantities, play a part in the formation of the fragrance according to F. LaFace (*S.P.C.* 33: 261, 1960). It is, moreover, a well-known fact that the bergamot oils of certain localities, in spite of their low linalyl acetate content, are much appreciated owing to their exquisite bouquet.

Normal physical and chemical methods of analysis have previously established the presence of *d*-limonene, dihydrocuminyl alcohol, a series of substituted coumarins (bergaptene, bergaptol, citroptene and bergamottin). . . . By new techniques, Herout, V. Ruzicka, Vrany and Sorm have sought to elucidate the composition of the terpenic and sesquiterpenic fractions and they have arrived at the following conclusion: the terpene fraction contains, in addition to *d*-limonene, α and β pinenes. In the sesquiterpene fraction bisabolene, β-caryophyllene and bergamottene, a new type of bicyclic sesquiterpene, have been identified.

Unpublished researches, carried out in the Reggio-Calabria institute with the aid of a combination of modern procedures, have demonstrated that, so far as the esters are concerned, linalyl acetate is accompanied by small and variable proportions of geranyl, neryl and terpinyl acetates. As for the alcohols, in addition to the linalol and nerol already discovered the existence of geraniol and terpineol has been established. Citral is likewise not the sole constituent of the carbonyl fraction, for aldehydes C_9, C_{10} and C_{12} are also present. Among the terpenic hydrocarbons—linonene and the pinenes being already known—γ-phellandrene, γ-terpinene and *p*-cymene have been revealed.

Since the proportion of oxygenated products that accompany the two principal constituents, linalyl acetate and linalol, is very small, while the olfactory differences they are capable of producing can be considerable, the part which they play appears to be connected with the function of "positive paragenoses," described by Arno Muller. There are substances capable of modifying and improving the scent of an essential oil, which could not be reproduced by the mere mixing of constituents found by the normal means of analysis. The importance of "paragenoses" may also be deduced from the fact that the essential oils obtained from very ripe fruit, although notably rich in linalyl acetate, have a less aromatic and a more insipid odor.

Research has moreover shown that minor oxygenated constituents are present in all the samples examined, but the ratio between them is variable, which may account for differences in the olfactory note. It is well known that if unripe fruit is submitted to treatment, oils of harsh odor, which smell "green," are obtained.

By means of chromatographic and spectro-photometric research, it has been possible to establish that the non-volatile residue of oil of bergamot contains, besides coumarin compounds, a substance having a tart, disagreeable odor; on comparing essential oils extracted with the sponge, the Calabrese machine and the *pelatrice*, the product with a negative odor referred to was found to comprise 4.5 per cent of the residue of the hand-produced oil, 15 per cent of the oil from the Calabrese machine and 40 per cent of the oil obtained by the *pelatrice*, when abrasion was deliberately pushed beyond the normal limits.

The non-volatile substance of disagreeable odor is probably related to the sterols and fatty acids.

Phenylnitroethane

The two physiological forms of *Ocotea pretiosa* (Nees) Mez (family *Lauraceae*) can be distinguished by the odor of their wood. The sassafras-smelling variety contains safrole, whereas the cinnamon-smelling variety contains methyleugenol as major oil component. This finding does not account, of course, for the observed smell of cinnamon, which must be due to a minor constituent with a very pronounced odor. This has now been isolated and identified.

The constituent which confers to the wood and bark its cinnamon-like odor and flavor was isolated and identified by O. R. Gottlieb and M. T. Magalhaes (*P. & E. O. R.* 51: 19, 1960) as 1-nitro-2-phenylethane.

The nitro-derivative exists in the wood and bark of the plant and is not formed secondarily during the vapor distillation, since it can be obtained also by solvent extraction.

To the authors' knowledge no reference exists in the literature to the organoleptic properties of 1-nitro-2-phenylethane. Surprisingly, the chemists who were the first to prepare this compound in a pure state did not mention its strong cinnamon-like odor (with a flowery bynote) and flavor. Nevertheless, these organoleptic qualities cannot even be considered to be completely unexpected. Even if the relation between molecular structure and organoleptic quality is still a matter for discussion, the similarity of odor of such pairs as benzaldehyde and nitrobenzene (almond-type), vanillin and 4-nitroguaiacol (vanilla-type), cinnamic aldehyde and ω-nitrostyrene (cinnamon-type) is strik-

ing. Dihydrocinnamic aldehyde, the partner of 1-nitro-2-phenylethane in this series, has a flowery rather than a cinnamon odor. The latter compound can be differentiated from cinnamic aldehyde precisely by its flowery bynote.

The essential oil obtained in 0.7-1.0 per cent yield from the bark of *Aniba canelilla* (H.B.K.) Mez was found to contain about 1 per cent eugenol, 15 per cent methyl-eugenol and 80 per cent 1-nitro-2-phenylethane. The latter substance, which is responsible for the cinnamon-like odor and flavor of the plant, was found also to be the main component of the wood oil (yield 0.9 per cent), where small quantities of eugenol were detected as well.

Ambroide G and Ambrettozon Extra

These two new perfume specialties are being offered by Haarmann & Reimer GmbH through their distributors, Verona Aromatics, Newark.

Ambroide G is a brown liquid which imparts no color to finished products and is stable in soaps. It combines the odor of natural Ambra with a typical dusty animal note; although its odor does not seem strong on the blotter, it is very lasting. It is an excellent fixative and is effective in rounding off compositions. Its use is recommended to the extent of 0.1 to 0.5 per cent in perfumes, 0.05 to 0.1 per cent in colognes, and 0.3 to 1.0 per cent in soap perfumes.

Ambrettozon Extra reproduces the fundamental and characteristic note of ambrette seed oil, esteemed for its peculiar musk-like odor, along with an interesting overtone. It is very lasting and should be used sparingly. It should be used in perfumes in proportions of from 0.3 to 1.0 per cent, depending upon the type; in Eau de Cologne and lavender water oils from 0.1 to 0.2 per cent; in cosmetic perfume oils from 0.3 to 1.0 per cent; and in soap compounds from 0.5 to 1.0 per cent.

Hair Diameter

A study of the diameter and growth phase of hairs was made from scalp sections in twenty autopsies by S. C. Atkinson, F. E. Cormia, and S. A. Unrau (*Brit. J. Dermatol.* 71: 309, 1959). The subjects varied in age from prematurity to 88 years.

Hair diameters varied from 0.02 mm. to 0.09 mm., with averages of 0.04 mm. in the first year of life and 0.065 mm. in subjects ten or more years of age.

In the first year of life, 77 per cent of hairs were small (0.027 mm. or less in diameter). The percentage of "small hairs" varied between 2 and 28 in subsequent decades, being somewhat higher in the older groups. The higher percentage of "small hairs' in older subjects is in agreement with the general trend toward structural atrophy with advancing age.

The percentage of resting scalp hairs varied between 4.5 and 22. It was low in the first decade, about 20 in the next three decades, and decreased in the older groups. The diminution in the percentage of resting hairs in older subjects indicates either that the growth phase is prolonged beyond the normal span or that telogen-type hairs are more rapidly shed.

Aged Sebaceous Gland Secretion

The amount of sebum excreted by the sebaceous gland has been shown to be influenced by several major factors. Miescher and Schonberg have demonstrated that the amount of sebum excreted is dependent upon the size of the sebaceous gland.

Sex hormones influence sebaceous gland excretion. In castrate or eunuchoid males, administration of testosterone produces sebaceous hyperplasia. In normal prepubertal males, testosterone also produces sebaceous gland hyperplasia. The recent work of Rothman, Lorincz and co-workers indicates that progesterone in combination with a hormone from the anterior pituitary gland, sebotropin, causes sebaceous gland hyperplasia in animals. This finding offers for the first time convincing explanations for sebaceous hyperplasia in females at puberty coinciding with the onset of ovarian production of progesterone and for the decrease in sebum excretion in aged women occurring at the end of ovarian functional activity. Also, it has been possible to produce or aggravate acneform lesions in young women with progesterone.

It was the purpose of this study by J. G. Smith, Jr. (*A.M.A. Arch. Derm.* 80: 663, 1959) to evaluate the effects of parenterally administered testosterone and progesterone on the aged sebaceous gland of males and females, respectively, and to compare them with normal untreated adolescent control persons.

The sebaceous gland excretion level of five females, aged 15 to 17 years, and six males, aged 15 to 18 years, was determined. Similar studies were carried out on five females, aged 70 to 87 years, and four males, aged 73 to 82 years. After control studies had been obtained on four consecutive days on the aged men and women, 1 ml. of testosterone enanthate in sesame oil was administered intramuscularly to the males, and 2 ml. of hydroxyprogesterone caproate in sesame oil were administered intramuscularly to the females at weekly intervals for a period of five weeks. After these five injections, sebum tests were again performed on the aged group for four consecutive days. Seven weeks after receiving their last injections, sebum tests were repeated on the group of aged males and females for three consecutive days.

Using a refined technique of measuring sebaceous gland excretion by measuring densitometrically the amount of osmic acid reduced on filter papers applied to the forehead for 30-40 minutes daily over a 3-4-day period:

The absence of a significant difference in sebaceous gland excretion of the adolescent male and female was confirmed.

The finding of no significant difference in sebaceous gland excretion of the aged male as compared with the adolescent male was confirmed.

The decrease of sebaceous gland function in the aged female as compared with the adolescent female was also confirmed.

The aged male sebaceous gland responded to the administration of parenteral testosterone with increased excretion.

The aged female sebaceous gland responded to the administration of parenteral progesterone with an increase in excretion to levels not significantly different from that of the adolescent female gland.

These increases in glandular function were temporary and excretion levels returned to pretreatment range within seven weeks of cessation of hormone administration.

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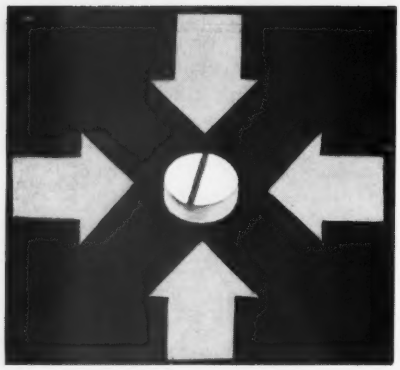

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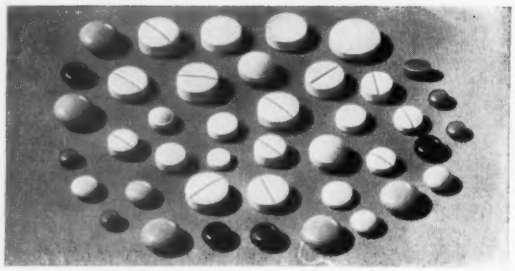

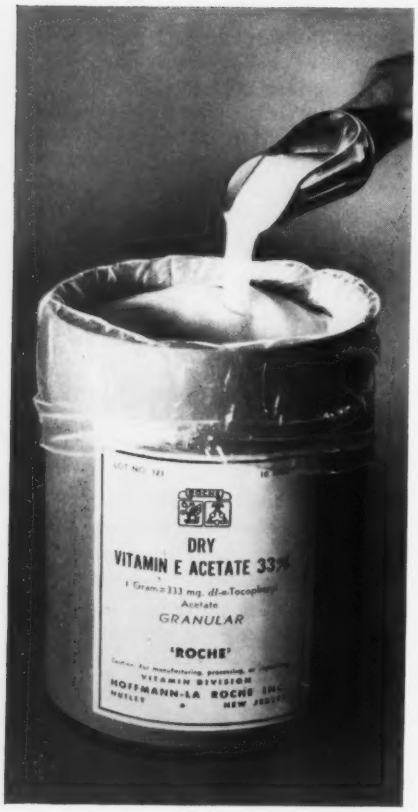

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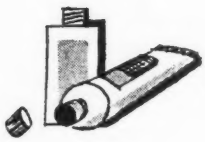

Advancing Therapy

Synthetic Penicillins

The discovery of the presence of the 6-aminopenicillanic acid moiety of penicillin in fermentation broths by Batchelor et al indicated the feasibility of synthesizing a great variety of penicillins by combining this material with acidic side chains by synthetic techniques. The isolation of large quantities of 6-aminopenicillanic acid has permitted the synthesis of more than 500 new penicillins that cannot be made by fermentation techniques. This paper by A. Gourevitch et al (*Antibio. and Chemother.* 10: 121, 1960) deals with a series of penicillins.

The penicillins to be considered have side chain lengths in which *n* is varied from 0 to 3 and in which the aryl group, Ar, represents phenyl or substituted phenyl groups. In the accepted nomenclature of this type of penicillin, the side chain of penicillin does not include the carbonyl group. One of the penicillins described, namely, α-phenoxyethyl penicillin, in which *n* equals 0 and Ar equals phenyl, was found to have superior attributes and studies have been reported on its chemical, microbiological, pharmacological, and clinical properties. This paper presents the effect of such alterations on the in vitro activity against sensitive and resistant *Staphylococcus aureus strains*, on serum binding, and on the in vivo activity against *Staph. aureus* infections in mice.

The data indicate that in vivo activity decreases with increasing chain length above the phenoxyethyl side chain. The phenoxyethyl compound is more active than the phenoxymethyl (penicillin V), making α-Phenoxyethyl penicillin the most active penicillin in this series by this particular test. While lengthening the side chain has little if any effect on the minimum inhibitory concentration against the Smith strain of *Staph. aureus* in heart infusion broth, it increases the minimum inhibitory concentration in the presence of 50 per cent serum indicating increased serum binding. In relation to the resistant *Staphylcoccus*, the compounds with the phenoxypropyl and phenoxybutyl side chains appear to be somewhat more active in the absence of serum than that with the phenoxyethyl side chain. This advantage would disappear if serum binding is taken into consideration. The compound with a phenoxyamyl side chain appears to have less activity against the resistant *Staphylococcus* strain.

The effect of substitution in the phenyl group is more difficult to interpret because of the diversity of structures. In general, it appears that there is a relationship between molecular weight of the side chain and serum binding.

Librium Tranquilizer

A new drug, with a broad range of pharmacological activity, gives promise under current clinical testing of having diverse therapeutic applications according to T. H. Harris (*J.A.M.A.* 172: 1162, 1960). Methaminodiazepoxide (7-chloro-2-methylamino-5-phenyl-3H-1,4-benzodiazepine-4-oxide hydrochloride), one of a new class of compounds, exerts three primary actions, namely, (1) tranquilization, (2) muscular relaxation, and (3) anticonvulsant effect. According to Randall it is unlike other tranquilizers in that it calms laboratory animals without inducing sedation or motor inhibition. While possessing the tranquilizing properties of chlorpromazine and reserpine, it lacks their autonomic blocking effects. It is more active than meprobamate, chlorpromazine, and phenobarbital in antagonizing pentylenetetrazol induced convulsions; more potent than the first two in preventing electroshock convulsions, and different from phenobarbital in that it does not induce hypnosis. It blocks spinal reflexes at lower dosages than meprobamate, a property which accounts for its stronger muscle-relaxant effects.

Its unique action on vicious, agitated monkeys, dingo dogs, and other wild animals stimulated the first clinical trials with the drug. At a recent symposium (University of Texas Medical Branch Symposium on Newer Antidepressants and Other Psychotherapeutic Drugs; Their Use in Psychiatry and Other Branches of Medicine, Nov. 13 and 14, 1959), investigators in a number of medical specialties, including internal medicine, cited impressive results obtained from use of methaminodiazepoxide in a variety of conditions and a freedom from side-effects at therapeutic dosage levels. These investigations confirm findings that the drug reduces anxiety and agitation but does not cloud consciousness or impair intellectual function. Experience with its use in all types of anxiety, convulsive disorders, tension states, obsessive-compulsive conditions, agitated depressions, and jitters in alcoholics indicated that methaminodiazepoxide is one of the most interesting drugs of its type that has been developed. Of special interest is its apparent effectiveness in obsessive-compulsive neuroses, which have thus far defied chemotherapeutic management. It has been shown to have a margin of safety greater than meprobamate, and it approaches the activity of the phenothiazines, without their potential toxicity, in decreasing anxiety, mainly in neurotic patients. In certain patients the compound has a calming effect, while in others it has an elevating effect and increases drive; there are no extrapyramidal complications. A site and mode of action have not been delineated.

In human tolerance studies of the drug under controlled conditions, there was no evidence of cardiovascular disturbances and no significant changes were observed in hematocrit values, red and white blood cell counts, or kidney or liver function. The only important side-effects were drowsiness and ataxia. Drowsiness frequently subsided spontaneously after a day or two, and always with a slight decrease of the dose. Ataxia is a clinical sign of excessive

dosage and disappears with smaller doses. Increased appetite and weight gain, which may be desirable effects in tense, anxious patients, have been reported.

The onset of action of methaminodiazepoxide is prompt, usually within one day, sometimes within a few hours. Evidence of habituation or postmedication depression has not been observed. Usually methaminodiazepoxide is administered orally, but it has been given in single intravenous doses as an aid to diagnosis in acutely agitated patients.

Tolbutamide for Parkinsonism

Because a marked diminution of tremor of hands and fingers was noticed in a diabetic receiving tolbutamide, E. W. Gates and I. Hyman (*J.A.M.A.* 172: 1351, 1960) began to use tolbutamide in patients with paralysis agitans. The studies have been continued for a year and a half, and the results have been observed in 15 patients. Eleven of the patients showed considerable reduction of tremor or rigidity or both. In several there was a marked improvement in the mask-like facies, with return of a more normal smile. In several patients, improvement of speech was noted. Care was taken to minimize the psychic effect of a new drug. It was determined that the improvements were not related to hypoglycemia. The significance of these findings is not clearly understood, but the results are consistent and indicate the need for further research on man and animals.

Reducing Cholesterol Levels

Among hypocholesterolemic agents recently made available for clinical trial is N-(1-methyl-2,3,dip - chlorophenylpropyl) - maleamic acid (Benzmalecene, Merck Sharp and Dohme), said to inhibit incorporation of acetate and mevalonic acid carbon atoms into cholesterol by rat liver homogenates, to inhibit development of hypercholesterolemia in chickens fed a diet containing 2 per cent cholesterol and 5 per cent cottonseed oil, to reduce the magnitude of cholesterolemia in rats fed a natural diet to which saturated fat was added, and to reduce serum cholesterol levels in dogs maintained on standard laboratory rations. R. H. Furman et al. (*Proc. Soc. Exptl. Biol. Med.* 103: 302, 1960) administered Benzmalecene to one hypercholesterolemic human subject and two normocholesterolemic subjects and noted reduction of cholesterol levels in each. Unusual changes in serum lipid pattern were induced.

The compound uniformly produced loss of appetite or nausea which prompted one subject to refuse further medication after 12 days of treatment. Laboratory results included decreases in serum total and esterified cholesterol concentrations; decreases in the cholesterol and phospholipid content of alpha and beta lipoproteins; increases in serum phospholipid and triglyceride concentrations; increases in the cholesterol and phospholipid content of low density lipoproteins; decreases in the C:P ratio in whole serum and in alpha and beta lipoproteins.

The compound has extraordinary lipid-altering properties which warrant further investigation, but the increase in low density lipoprotein lipids may be an undesirable effect.

Seventh Medicinal Chemistry Symposium

The Seventh National Medicinal Chemistry Symposium of the American Chemical Society will be held at the University of Rhode Island, Kingston, R. I. June 20 to 22, 1960. Sessions will be devoted to Antibodies as Model Biological Receptor Sites; Hypertension; Newer Chemical and Biological Techniques; "Non-Classical" Physiological Actions of Steroid Hormones, Analogs and Metabolites; Recent Developments in Medicinal Chemistry; Chemistry of Natural Products; and The Biochemistry and Neurophysiology of Brain. Information concerning registration is obtainable from Medicinal Chemistry Symposium, College of Pharmacy, University of Rhode Island, Kingston, R. I.

Ostensin (Wyeth) is trimethidinium methosulfate, a long acting ganglionic blocking agent for the treatment of hypertension. It is supplied as 20 mg. and 40 mg. scored tablets in vials of 100.

Syntussin Compound (Ivers-Cameron) is designed for the relief of cold symptoms. Each capsule contains 2 mg. chlorpheniramine maleate, 7.5 mg. phenylephrine hydrochloride, 10 mg. dextromethorphan hydrobromide, 64.8 mg. terpin hydrate, 194 mg. acetaminophen, and 25 mg. ascorbic acid. The preparation is supplied as bottles of 48 capsules.

Furacin Inserts (Eaton) contain 0.2 per cent Furacin and 2 per cent diperodon hydrochloride, a local anesthetic, in a water-dispersible base composed of glyceryl monolaurate and sorethytan (4) monostearate. The preparation is intended for anesthesia and topical treatment of bacterial infections, and is available as a box of 12 inserts, each 1.3 grams.

Anturan (Geigy) is sulfinpyrazone, in scored tablets of 100 mg., for the treatment of chronic gout, is available in bottles of 100.

Disamide Diuretic

5-Chloro-2,4-disulfamyl toluene, "Disamide," is a non toxic orally active diuretic agent which has been compared with acetazolamide and chlorothiazide by A. David and K. P. Fellowes (*J. Pharm. Pharmacol.* 12: 65, 1960). Disamide at half the dose of chlorothiazide caused a greater diuresis and natural excretion but had a slightly less Cl excretion. The carbonic anhydrase inhibitory activity was 0.4 times that of acetazolamide but unlike the latter Disamide still caused diuresis after prolonged administration. Disamide and chlorothiazide were found to have no effect on blood pressure or respiration. The anti-convulsant activity in mice is similar to acetazolamide. The new diuretic agent has no antibacterial, hypoglycaemic or analgesic properties.

Diuretic Spirolactone

The new spirolactone sc-9420 was tested by V. Cejka et al (*The Lancet* 1960, p. 312) under standardized conditions in a patient with heart-failure, who excreted large amounts of aldosterone in his urine and who for 6 years had not excreted sodium in the urine except when mercurial diuretics were given. The spirolactone induced an appreciable sodium output, while the potassium output remained almost constant. The characteristic excretion pattern could be distinguished from that produced with various other diuretics in the same patient. Side-effects were unimportant.

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Industry's Books . . .

Basic Office Dermatology, *by Stuart Maddin, M.D., Fellow, American Academy of Dermatology and Syphilology, Julius L. Danto, M.D., Fellow, American Academy of Dermatology and Syphilology, and William D. Stewart, M.D., University of British Columbia, 203 pp., Illus., Charles C. Thomas—Publisher, Springfield, Ill. (1960), cloth,* **$11.75.**

The significant features of this latest work are: an emphasis on correlation between internal medicine and dermatology; practical applications of the mechanisms of allergy in dermatology; a unique section on the care of normal skin, including cosmetics, shampoos, sun exposure, and the like; and diagrammatic instructions for patch testing, examination for fungi, and skin biopsies. Fifteen color plates add a further dimension to remarkably good black and white photographs. The regional distribution of dermatoses is a major portion of the presentation.

Plastics Engineering Handbook of The Society of the Plastics Industry, Inc., *Third Ed. (1960), 565 pp., Illus., Reinhold Publishing Corp., New York, cloth,* **$15.**

This well-known reference on plastics materials, methods, and fabrication is now revised and expanded. The new edition adds the advances made since 1954—advances so numerous that the handbook now appears in a larger, double-column format. There is much new material on nomenclature, cellular plastics, decorating, welding, and plastics as adhesives. The book describes every step in the manufacturing operation, and includes the experience and know-how of over 200 technicians and authorities. The text is fully illustrated with hundreds of photographs, tables, and charts.

Handbook of Pest Control, *(The Behavior, Life History, and Control of Household Pests), Third Ed., By Arnold Mallis, Entomologist, Gulf Research & Development Co., 1132 pp., MacNair-Dorland Co., New York, (1960), cloth,* **$12.50.**

This handbook will serve as an introduction to household pests for those unversed in the pursuit of vermin and as a reference work for those accomplished in the art. The author has extensively revised the second edition and has added many new references. The changes are most evident in the sections on control, for insecticides have undergone remarkable advances since the first edition was published in 1945. Most of the common household pests are illustrated, and the reader, by referring to both the text and illustrations, should be able to identify many of them.

Vacuum Processes In Metalworking, *by J. Wesley Cable, Consulting Engineer, 202 pp., pocket size, Reinhold Publishing Corp., New York, (1960), cloth,* **$5.50.**

In general, the aim of this book is to present vacuum technology in a descriptive manner, rather than in a highly technical form. As a result, it is beneficial to any industry involved in the refining and processing of metals.

Acrylic Resins, *by Milton B. Horn, Catalin Corp. of America, 184 pp., Reinhold Publishing Corp., New York, (1960), Cloth,* **$4.50.**

This book describes the four types of acrylics in respect to their manufacture, fabrication and applications. These types include cast products, molding compounds, emulsion and solution compounds, and this is the first coverage of all types in one book. The author explains raw materials and manufacture of these polymers sufficient to an understanding of the problems involved in fabrication and application.

British National Formulary 1960, *Standard Edition, 272 pp., pocket size, The Pharmaceutical Society of Great Britain, London, cloth,* **7s. 6d.**

The Joint Formulary Committee, representing the medical and pharmaceutical professions, was established in 1946 to compile a standard prescribers' formulary. This Fifth Edition is brought up-to-date in relation to all new formulations.

Detoxication Mechanisms *(The Metabolism and Detoxication of Drugs, Toxic Substances and Other Organic Compounds),* by R. Tecwyn Williams, *Ph.D., (Wales), Professor of Biochemistry in the University of London, Second Ed., 795 pp., John Wiley & Sons Inc., New York, cloth,* **$19.**

Organic compounds which are normally considered foreign to the body are now employed by man on a vast scale and they enter into almost every phase of the civilized existence. Thus synthetic organic compounds are used as drugs for sickness, pesticides of various kinds (herbicides, insecticides, etc.) for agricultural and health purposes, coloring matters, emulsifiers and stabilizing agents for food and drink, dyes for clothes, cleansing agents for all manner of purposes, beauty preparations, spermicides for population control, explosives and poison gases for military use and so on. It is therefore important to know what happens to these compounds, why they get into the body, since it is essential that the body can get rid of them without being damaged in the process or, if they cause damage, that their use should be avoided and a search be made for a less harmful substance. The present book is therefore an account of the chemical aspects of the fate of organic compounds other than those normally considered under fat, carbohydrate, protein, vitamin, steroid and mineral metabolism.

American Drug Index 1960, *by Charles O. Wilson, Ph.D., Dean and Professor of Pharmaceutical Chemistry, Oregon State College, and Tony Everett Jones, Ph.D., Associate Professor of Pharmaceutical Chemistry, University of Colorado, 712 pp., J. B. Lippincott Co., Phila., cloth,* **$5.75.**

The American Drug Index has been prepared for the identification and correlation of the many pharmaceuticals available to the medical and allied professions. Data included are generic name, chemical name, manufacturer, pharmaceutical forms, size, dosage and use. This work should be most useful to physicians, pharmacists, dentists, nurses, and to sales personnel, students and teachers in the fields incorporating pharmaceuticals.

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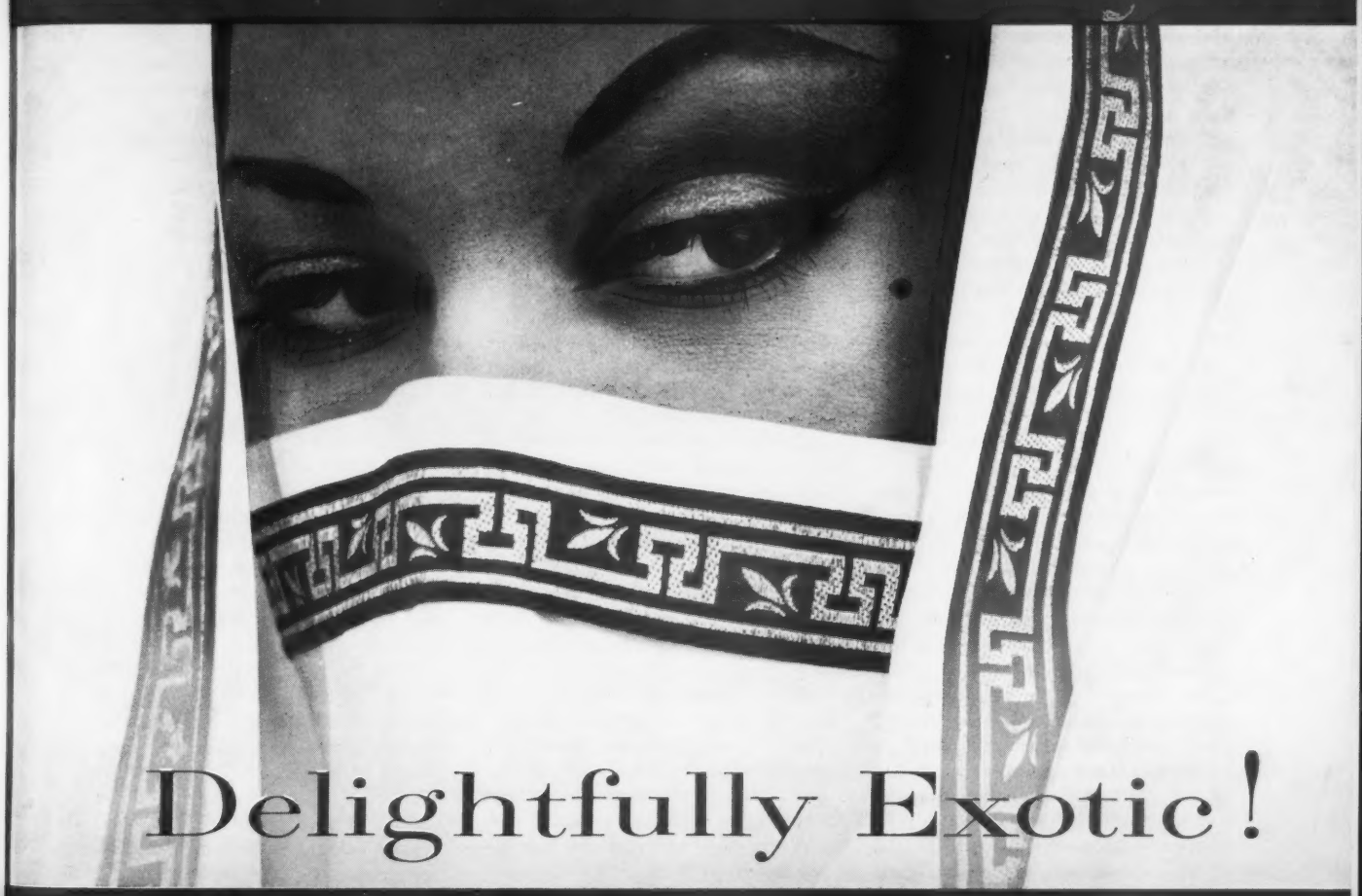

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Compounder's Corner

Solar Lipstick

In a paper entitled "Solar lipstick —a protective device," published in the *Medical Journal of Australia*, Mowatt and Robertson have described the use of a lipstick containing an ultraviolet screening agent in the treatment of keratoses and malignancies of the lips. They reported that a film of lipstick 0-01-0-02 mm. thick, containing 5 per cent of salol, cut off 93 per cent. of incident radiation in the erythemal band and was clinically satisfactory. No formulation details were given, however. This paper by D. M. Bryce (*Pharm. J.* Feb. 13, 1960, p. 127) describes the preparation of such a lipstick and provides a working formula for use with simple apparatus.

Lipstick manufacture is basically an exercise in crystallization. In its simplest form, a lipstick contains a solvent, which is a suitable oily vehicle, and a solute, which is a balanced wax mixture. In more complex forms, such as cosmetic pastes, there are additional solid, liquid and gaseous phases with which to contend. Time, temperature, concentration and nucleation are the main physical factors determining wax structure, which should be of a fine grained gel type in order to effectively retain the solvent. Formulation falls into two stages: First, preparation of a vehicle that will wet and spread suitably over the skin surface, and, second, the selection of a wax blend to effect solidification. This, of course, is a simplification, for there will be interaction between the solid and liquid components, the one modifying the other according to the nature of the substances being used.

The solvent system will be considered first. Salol is solid at normal skin temperatures and must, therefore, be dissolved in order to exert its screening function as a well distributed film on the skin. Lipsticks, usually, are of two types—based on castor oil and oleyl alcohol respectively. Mineral oil is also commonly used. The properties of the basic vehicle are then suitably modified chiefly by means of esters, with and without marked surface activity, to give the type of application and other properties required.

Of the three primary vehicles, only castor oil has the necessary solvent action on salol, and it can be used to prepare a satisfactory stick. However, preliminary experiments suggested that the most cosmetically acceptable stick would be based on oleyl alcohol. As the solubility of salol in oleyl alcohol is too low to give the required concentration of sunscreen, a proportion of the ester, isopropyl myristate was added. This gives an effective solvent that readily spreads on and penetrates into the epidermis of the lips without causing any unpleasant sensation.

The following considerations govern the choice of the wax mixture: The resultant paste must be readily moldable. It should set quickly to give a stick of good appearance that is strong enough to withstand normal use without breaking, but not too tough to be difficult to apply—sufficient material should be transferred from stick to lip under light finger pressure to avoid further damage to the lip. The product must be neither too greasy in application, nor yet so tacky as to cause excessive "drag" or "pull." The resultant film must not cause a "coated" sensation on the lip that might discourage regular use. Finally, the stick must not soften or harden excessively under the conditions of use and no significant chemical or physical deterioration should occur within the normal span of use.

The waxes commonly used in lipsticks are carnauba, beeswax, candelilla, hard paraffin and microcrystalline waxes. The most generally applicable is probably candelilla, but for the type of vehicle selected a paraffin wax/ozokerite mixture was particularly suitable. The ozokerite imposes its microcrystalline habit and the mixture yields a stick with adequate strength and shrinkage and excellent solvent retention, particularly when used in conjunction with a low-melting point paraffin wax. A proportion of carnauba was added to increase the strength and melting point of the paste. It promotes rapid setting and helps to produce a good glossy stick, and is also said to contain natural antioxidants. About 25 per cent of the wax mixture was required to solidify the solution of salol, and, when molded in a small brass split mold, yielded a stick of good appearance. The basic formula is as follows, all ingredients being of cosmetic quality:

Canauba wax (setting point 80° C.), 4; Ozokerite (setting point 62° C.), 8; Hard paraffin (setting point 50°C.), 16; Oleyl alcohol, 47; Isopropyl myristate, 20; Salol, 5.

A suitable preservative is 0.1 per cent of propyl *p*-hydroxy-benzoate. An antioxidant is not essential with this preparation, though it would be in a stick based on castor oil.

TEA Glycerophosphate

If we look up the major components of lecithin: glycerol, phosphoric acid, ethanolamine, inositol, choline, and other minor constituents plus some fatty acids, the thought naturally occurs to H. C. Janowitz (*S. P. C.* 33: 175, 1960) why not try glycerophosphoric acid with some triethanolamine and add some inositol and choline? Tests show, however, that in the course of neutralization, the glycerophosphoric acid gets warm or even hot and, when heated, decomposes.

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So one starts with simple acid phosphoric 85 per cent, of which 25 grams are mixed with glycerin 25 grams and neutralized with 35 grams of triethanolamine. This gives a *p*H of about 6, which is about right. Otherwise, more phosphoric acid or more of the ethanolamine has to be used to buffer the mixture to the desired *p*H.

As stated above, this mixture evolves heat and, during this self-heating, esterification takes place. To the finished compound traces of inositol may be added.

This mixture has some interesting properties. It can be used for a face lotion or skin freshener, by simple addition of water and a little alcohol. It can be used as an astringent by taking less TEA and therefore bringing the *p*H to a lower point, or vice versa by addition to make a slightly alkaline solution. It can be used in nearly every type of w/o emulsion and in the modern moisture creams with particularly good results. By a special trick, it is even possible to make with it a mildly acid vanishing cream.

By omitting the glycerin in the above formula and by adjusting the rest to the calculated glycerin content, it can be worked into glyceryl monostearate, glyceryl distearate and other fatty acid esters.

Its softening, smoothing and refreshing properties are quite good, apart from its chemical and clinical value.

German Cosmetic Research

Papers given at the second conference of the Society of German Cosmetic Chemists held November 1959 in Baden-Baden were abstracted in *Manuf. Chem.* 31: 108, 1960 and a number of these are being reproduced here.

A. Szakall and K. H. Schulz determined how far aqueous solutions of alkyl sulfates and of sodium salts of saturated fatty acids containing from 8 to 18 carbon atoms in the molecule penetrate the intact skin. The solutions were allowed to act three times for 30 min. on the forearm of a healthy person, and the degree of permeation was found by determining gravimetrically how much of the aqueous solution was lost during the time of the experiment. Out of all the alkyl sulfates and sodium salts tested those with 12 carbon atoms in the molecule showed the highest permeation values. Those with 14, 10 and 16 carbon atoms came next, while those with 8 and with 18 carbon atoms showed about the same permeation as water. As in previous investigations an analogous order was found for the skin irritation of these compounds, there is apparently a close relationship between permeation and irritation. Permeation through the horny layer of the skin, the lower part of which acts as a barrier, is a condition for causing irritation.

In confirmation, the question why fatty acids of medium chain length are most irritating to the skin was investigated by G. Neis. For this purpose the first carbon atom of some fatty acids containing from 12 to 18 carbon atoms in the molecule was made radioactive. This made it possible to find out how far the various acids penetrated into the skin. They were allowed to remain in contact with the skin for 24 hr., and skin cuttings were then examined with the help of photographic films. It was found that stearic acid stops at the barrier, while lauric acid penetrates much further. It is therefore assumed that lauric acid causes much greater irritation to the skin than acids with shorter or longer carbon chains, because it penetrates deeper into the skin.

G. Erlemann discussed several aspects of hair preparations. Thioglycolic acid still takes first place amongst the chemicals used in hair cosmetics. A compound to replace it would have to comply with the following requirements:

1. Good transformation of the hair lasting about three months.
2. Minimum damage to the hair.
3. Unobjectionable from a medical point of view (toxicity and sensitivity).
4. Effective within 15 minutes.
5. Easy to apply.
6. Reasonable price.

Compounds like thiohydantoin or the esters of trithiocarbonic acid are no improvement, as in solution they hydrolyze to thioglycolic acid. The use of mustard oil acetic acid has often been discussed. It has now been possible to explain the mechanism of the reaction of this compound with amines. Mustard oil acetic acid as 3,4-dioxo thiazolidin is first decomposed by aminolysis to urea thioglycolate, which is unstable and immediately decomposes by aminolysis and hydrolysis to thioglycolic acid and its amide.

The further development of hair dyes is a problem of organic chemistry. By oxidative coupling Hunig and his assistants synthesized azodyes under conditions which are very similar to those of hair dyeing.

A number of compounds have been tested to find out whether they penetrate into the skin and are taken up by the hair roots and built into the hair. Because of the dominant position of sulfur in hair cosmetics, the following sulfur compounds—all containing radioactive sulfur S^{35}—were tested; elementary sulfur, methionine, and the ethyl and benzyl esters of acetyl methionine. When rubbed into the skin elementary sulfur showed the highest proportion of built-in sulfur, but after subcutaneous injection methionine and its esters gave the higher result. A remarkable result was achieved when "dead" (cut off) hair was left for seven days in a solution of elementary sulfur containing S^{35} and the organic compounds of the hair X (cystine and methionine) acquired S^{35} radioactivity.

A new method has now been developed by R. Haensch and W. Blaich following a suggestion made by Brun. A filter paper is placed on the skin, and the lipids taken up are colored with Sudan black and separated by elution.

The color intensity, which corresponds to the lipid content, is determined photometrically. As a single measurement requires little time, a large number of tests can be carried out. The results showed considerable differences of the skin lipid mantle between healthy skin and cases of dermatosis. These differences are shown to a still greater degree if lipid regeneration is examined.

The new method has proved particularly useful for testing the effect and suitability of local therapeutic treatment and is likely to become an important tool for the scientific work of the cosmetic chemist.

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Readers' Questions . . .

Rancid Lipsticks: *A number of customers have complained that our lipsticks sometimes have a rancid taste. Since we use only the purest raw materials, we wonder if you can assist us in overcoming this difficulty.* BOSTON

Rancidity is the result of a breakdown, by hydrolysis and oxidation, of fats into fatty acids and smaller fragments, with an unpleasant taste and odor. In general, the greater the degree of unsaturation of the oil or fat, the more likely the oil is to become rancid, but the relationship is by no means absolute. Since oils, fats and waxes used in lipsticks usually are unsaturated to some extent, as measured by their iodine values, they are subject to oxidative breakdown. This process may be accelerated by contact with the moisture of the lips and by the oxygen-carrying potential of some lipstick pigments and colors. Direct solutions to this aspect of the problem lie in the avoidance of sensitive oils and waxes in the formulation, and the use of effective (and approved) antioxidants. Butylated hydroxyanisoles and toluenes and gallic acid esters could be routinely included in the lipstick mass.

Unpleasant odor and taste may be called rancidity by the consumer even when oils have not deteriorated. Ingredients themselves are not necessarily tasteless, and should be carefully evaluated with respect to taste before inclusion in the formula. A surprise taste offender may be the perfume, which can have both a pleasant odor and a vile taste. Finally, a flavor mixture may actually be used in the wrong concentration, or depend upon odor for the flavor sensation, so that again taste may be unattractive. Flavoring should thus be undertaken systematically: the mass should be freed, as much as possible, from those ingredients that are not vital, but do contribute an unpleasant taste; sweetening on a moderate level should be added, and then a neutral flavor should be used for covering purposes, but at a minimum level that will not be obtrusive.

This matter of over-flavoring, and over-perfuming, is important, in that even a pleasant effect should not be allowed to become overwhelming.

Skin Research

Pharmacology of the Skin

This is part of an abstract of a review on "Physiology and Pharmacology of the Skin 1958/1959" by G. H. Findlay and R. Kooij in "Dermatologica" vol. 119, pages 360 to 378, 1959. The original includes a complete bibliography.

Pharmacology

Frederiksson published a monograph on the percutaneous absorption and intracutaneous hydrolysis of three organophosphorus cholinesterase inhibitors. These highly dangerous "war gases" are readily absorbed through the skin and are difficult to remove once applied. *Shelmire* compared the measurable action of several drugs on the skin, using vehicles with differing emulsion and solvent properties and discussed their relation to solubility, availability, concentration, application time, penetration, skin hydratation etc. *Buettner* studied the diffusion of liquid water through human skin. Only a small portion from the water uptake is imbibed by the stratum corneum, the major part seems to enter the system. Below a critical humidity water vapor left the skin, above this "neutral relative humidity" the skin gained vapor. Atropine drastically curtailed vapor loss. *West* wrote a short, clear and authoritative review on the pharmacology of the mast cell in its broad biological setting. Its relation to heparin, coagulation and serum clearing; histamine, its synthesis, storage, release with fluorescent liberators and normal liberation with injury; hyaluronic acid and the formation of connective tissue, 5-hydroxytryptamine and skin pain are all discussed. *Askovitz* discussed the statistical problems in a double-blind test when the differences are either absent or graded. *Scott* reported that an assay of arsenic in the skin is greatly facilitated by making it radioactive in an atomic pile, and measuring this with a Geiger counter after selective extraction. Susceptible subjects appear to bind arsenic for years in their skin after oral administration of pentavalent salts, sometimes for over 30 years, and it may accumulate particularly in the keratoses. *Scott* studied the ability of the epidermis to retain ziinc and mercury, using autoradiography after applying salts of their radio-isotopes. The pattern of metal retention was related to the sulphydryl distribution, and was influenced by disease and by therapy in a way corresponding to the changes in available SH groups. *Di Paolo, Chu* presented histochemical evidence for a lowering of insoluble sulphydryls within a few hours after the application of carcinogens in mouse skin. *Harrold* found that surface active agents per se do not denature keratin, since the non-ionic agents have little effect on the numbers of available sulphydryl groups compared with anionic detergents. *Magnus* studied the binding of sensitising metals (Ni, Co, Cr^6) and eosin to protein to examine the conditions influencing their attachment to the epidermis. Their action as haptens must be explained in this way, and observations were made on the site and manner in which this could take place in human skin. It was found that hexavalent chrome could not become bound to protein as such in normal circumstances, though the other substances studied could do so. *Hunziker, Brun* found the antiperspirant action of aluminium chloride great regardless of the ph range tried, as assessed by the response to pilocarpine. *Skog* presented evidence that a selenium disulphide shampoo ("Selsun") exerts its main stimulus on the epidermis and sebaceous glands through detergents in the vehicle. *Young, Weiffelbach* proved that the addition of salicylic acid to a zinc oxide containing application (e.g. Lassar's paste) is useless because of the rapid formation of the virtually inert zinc salicylate. *Noojin, Lewis* made aseptic abrasions of a uniform type on the healthy skin of human subjects to study the influence of some wet dressings in common use on the healing process. The clinical and histological observations thereon showed that none of the various compresses had any great influence to the advantage or detriment of the regenerative process in its main phases. *Kinmont* discussed the clinical and statistical requirements for comparing two ointments both containing tar, in the treatment of various dermatoses. A synthetic tar was better than a crude tar. *Schneider et al.* determined the relative protective value of creams by a reflectometric method using a dyestuff whose concentration in different circumstances could be measured. *Hofs, Tunger* criticized the use of acanthosis production as a guide to the tolerance of ointment bases, especially as the acanthosis itself may be beneficial. *Heite et al.* stated that to judge the acanthotic action of an application to the skin, great care must be exercised to eliminate the wide normal scatter and the errors in manner of measurement of the values for the thickness obtained. *Schaaf* studied the influence of various fats, sterols etc., on the mitotic activity of the epidermis and consequent acanthosis with reference to its significance in the acanthosis test. *Hjorth* reported that industrial contact with thiamine led to eczema and positive patch tests with this substance in pure form. *Crowe et al.* found triamcinolone ointment 0.1 per cent therapeutically superior to hydrocortisone ointment 1 per cent in a left-right study. *Inman* concluded from symmetrical comparison of ¼ per cent prednisolone with

1 per cent hydrocortisone ointments on eczemas that the former was better in effectiveness and lower in price. *Robinson* reported that prednisolone can be applied in a Freon aerosol, a vehicle which may have advantages over creams in certain circumstances. *Witkowski, Kligman* assessed the anti-inflammatory action of corticosteroids by their suppressing action on croton oil pustulation. *Heilesen* made a study of hydrocortisone with terramycin in various conditions in which the antibiotic was considered to be an important adjuvant and where hydrocortisone alone may make matters worse, although mycotic eczemas may be made worse by this combination. *Schamberg et. al.* found in a significant study, comparing local steroid lotions with the lotion base, no differences in their effect on inflammatory dermatoses where the two sides were treated. The double blind method was used, and the improvements with the inert substances were ascribed to the "placebo reactor." *Wilson, Edwards* carried out a comparative study of the action of local glycyrrhetinic acid and local hydrocortisone, using one or the other for a week each and whichever the patient found best thereafter. A means of coding the results in terms of improvement anticipated from past experience of hydrocortisone is described, and the superiority of hydrocortisone over glycyrrhetinic acid was convincingly shown. *Jorgensen* applied glycyrrhetinic acid, which has a cortisone-like action on the electrolyte balance, in 5 per cent ointment for a week in some dermatoses which benefit from hydrocortisone as a rule. About half the cases improved, but the same number did as well in the placebo control group. *Malkinson* using C14 labelled testosterone and various steroids, measured by means of the gas flow cell the declining beta emission on the skin surface during cutaneous absorption of these substances. Testosterone penetrates well, but hydrocortisone does so notably only after preliminary artificial desquamation. *Rajka* reported that the rubefacient action of a nicotinic ester ("Trafuril") on the skin could be lessened by applying hydrocortisone ointment immediately afterwards. Observations on the time relations and concentrations were also made. *Murrell, Taylor* found that a nicotinic acid ester (the tetrahydrofurfuryl, or Trafuril Ciba) produced local erythema, a reaction which is in abeyance or may be replaced by blanching in rheumatic disorders and atopic dermatitis. The mechanism of action remains obscure, but it does not appear to work through the phosphopyridine nucleotides or histamine. *Fowlks* presented a study of the chemistry of furocumarins with special reference to the properties of psoralens and their photochemical alterations. *Daniels et al.* made a revealing study on the influence of 8-methoxypsoralen on sunburn and found this drug worthless in preventing sunburn and promoting tan. They also emphasized the influence of enthusiasm, the significance of "placebo-reactor" and the necessity of a double blind type of control study in evaluating a remedy. Contrasting with previous work *Stegmaier* considered methoxsalen nevertheless in certain times of the year and at a particular dosage to decrease sunburn and increase tanning when taken orally. *Burbach, Mees* reported red staining of hair after use of a hair lotion containing salicylate. This was due to the formation of a colored salicyl-iron compound, made up of salicylic acid derived from a hair lotion and iron from the hairpins on her scalp. *Schirren* presented evidence that resorcinfuchsin may stain hair and sweat after resorption from applications of *Castellani's* paint. *Gentles et al.* showed by bio-assay of the hair of guinea pigs that grisefulvin becomes somehow incorporated into growing keratin structures. Griseofulvin becomes somehow incorporated into growing keratin structures. Griseofulvin by mouth is known to clear pathogenic fungi from animal hair, acting from the root upwards. *Martin* showed that griseofulvin oinment (1 per cent) can suppress established trichophytic lesions in guinea pigs. *Lamont* showed that the choice of antibiotic for pyodermas depends on the prevailing organism, its prevailing sensitivity, the potential seriousness of the lesion, its relative tractability with antiseptics, and the adverse influences of the vehicle on the lesion and the release of active antibiotic from it. In the reported series chloramphenicol was superior. *Cormia, Dougherty* presented a thorough study of all sources of error in the testing of antipruritic (and likewise other) drugs, where symptomatic relief is sought as opposed to the cure of a particular disease, and the unsatisfactory nature of various reports on the uses of drugs and of the drugs themselves is indicated.

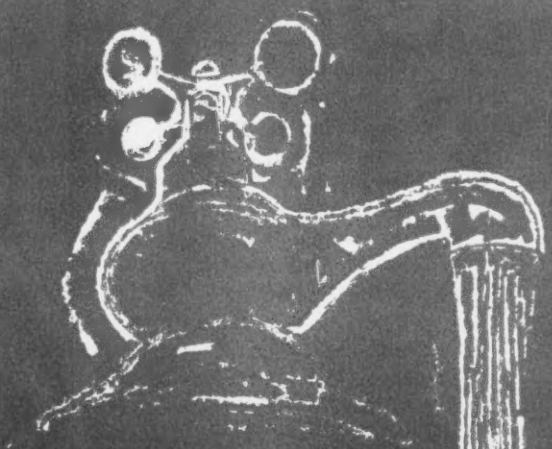
Eccrine Glands

Skin from the human scalp, removed under general anesthesia, is used as material by A. Charles (*J. Invest. Dermatol.* 34:81, 1960) in an electron microscope study of the eccrine sweat gland. In the secretory region of the gland lipid granules with a cap, or satellite, of a different substance, possibly pigmentary, are found. 'Dark' and 'clear' cells have been observed, essentially differing only in the greater amount of electron-dense cytoplasmic granules present in the former, which also appear not to contain secretory granules: the 'dark' cell may therefore be a pre-secretory phase of the cell. Numerous mitochondria are present, generally in close relationship to the secretory granules. The cell wall-membranes are papillate, and if the papillae interdigitate in an orderly manner the wall-membranes appear as convoluted double-membranes. If the papillae become disordered intercellular canals are formed. The myoepithelial cells are illustrated. As the duct ascends to the epidermis the large lumen first becomes surrounded by a dark, papillate cuticle, and then becomes completely occluded, the only channel left for the passage of sweat being between closely adpressed papillae. Within the epidermis the cuticle appears to keratinize and an unspecialized pore is formed.

Sebical Cream (Reed & Carnrick) is a combination of 2% allantoin, 2% coal tar extract, and 1% hexachlorophene in a penetrating greaseless base. It is intended for the treatment of scalp dermatoses and is available in two ounce tubes.

Motilyn (Abbott) is a new injectible pantothenyl alcohol product to restore intestinal function in cases of atony and delayed motility following surgery. It is supplied at 2 ml. ampoules containing 500 mg. or 10 ml. vials containing 250 mg. in each ml.

Chemipen (Squibb) is partially synthetic penicillin for oral use; it is available as tablets or syrup.



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(*Continued from page 518*)

effective as a salt remover, it sometimes caused nausea; this side effect resulted from the presence of a small residue of a chemical used in synthesizing the resin. The offending agent was removed. Further trials showed that a few patients lost more potassium than was desirable. The resin was again modified. Primary investigators then reported strikingly beneficial results. Indeed, so striking that several seasoned medical scientists hailed the resin's appearance as a new breakthrough in the fight against cardio-vascular diseases. A sizeable number of technical papers appeared in investigative journals. Science writers, eager to be in the vanguard of medical research, wrote many explanatory articles for the lay press. To meet what was certain to be a wide demand for our product, we built a special plant to process it. The product was Resodec—one of our biggest commercial flops.

Why did Resodec flop? It was an effective—in fact, often marvelously effective—drug. Unfortunately, it had the delightful taste and texture of wet sand. And to receive the drug's benefits, the patient had to eat an awful lot of it. The moral? When a distinguished clinical investigator tells his patients to eat sand, they eat it—especially since they're not paying for it. The ordinary physician, however, cannot exercise the same authority. This case illustrates one of the many variables that can affect clinical studies, and it points out the importance of having general practitioners conduct clinical evaluations on drugs that have already been proved safe and effective in medical centers.

Our special plant to process Resodec—the house built on sand—has since been torn down. I don't know how much its destruction cost, nor do I know how much we spent on the widespread educational campaign we conducted to familiarize physicians with the theories of electrolyte balance and the action of electrolyte binding resins. I do know, however, that our alleged medical breakthrough took seven years of time and about a half million dollars from our R & D funds.

The one good result arising from this failure, and a life-saving result for some patients, is a special resin made by SK&F which effectively reduces the dangerously high concentration of potassium in the bodies of patients with severe renal failure. This resin, used mostly to treat emergency cases, is a non-commercial product that we supply free to physicians.

Finally, let me recount a happier story.

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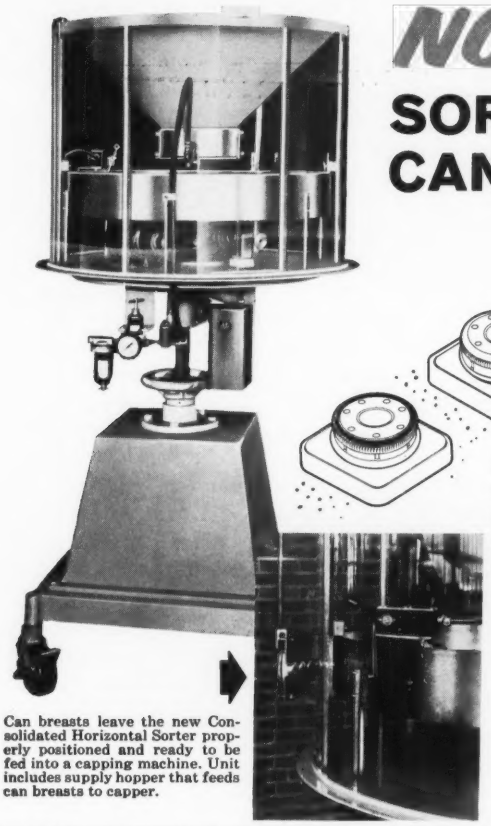
About 15 years ago, two of our pharmaceutical chemists, Dr. Rudolph Blythe and Harold Clymer, tackled the problem of developing an enteric coated product that would release medication more predictably than any then available. We thought one cause of irregular performance was the variable

(*Continued on page 550*)



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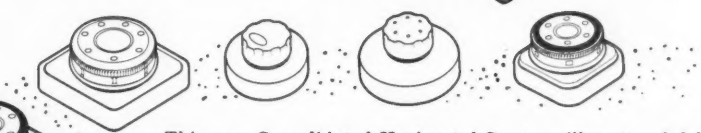

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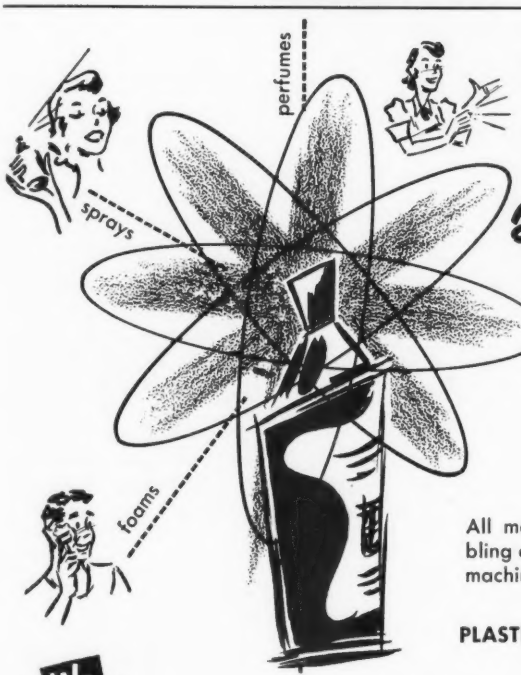

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(*Continued from page 548*)

lengths of time many of the comparatively large enteric coated tablets stayed in the stomach. We decided to try fragmenting tablets into small pills that could be encased in a gelatin capsule.

So, we went to work dividing tablets into pills, until we had gone about as far as we could go. We couldn't make anything smaller than about one-eighth of an inch. Although the dose unit showed some improvement over ordinary tablets, the improvement was scarcely large enough to be significant. We'd come to the end of the road. As small as each pill was, it would have to be shattered into many smaller pieces in order to come close to doing what we had in mind.

The problem was solved by Donald MacDonnell, an SK&F pharmacist with a sweet tooth. He was particularly fond of chocolate candy covered with nonpareils, little seeds of sugar. Why not coat minute pellets with medication? We did. But even though the pellets left the stomach at a fairly uniform rate, they did not release the entire dose of the drug at once because of variations in their disintgration time. Again, we had failed to reach our objective; however, in so failing, we came across a way to eliminate the pill, tablet, or teaspoonful of medication taken three, four, or more times a day.

It was in 1949, about five years from the start of our original project, that we came across the idea of using pellets of different size and coatings to release gradually extremely small doses of a drug over an extended period of time.

We were on the right track, but a tortuous track that led through a long series of formulations, animal tests, and vexing problems of controlling stability, solubility, and release rates. To solve these problems we had to devise new test procedures: for example, we learned to monitor absorption by measuring tracer elements of the drug in salvia; we learned how to watch the fate of the pellets in the body, by making them radio-opaque and, therefore, countable in X rays. Finally, about eight years from the beginning, the first sustained-release capsules were marketed, Dexedrine *Spansule* capsules.

Since then, SK&F has marketed 15 other sustained-release preparations. Each drug presented special problems, each required special techniques and bioassays before it could be made into a workable sustained-release preparation.

We haven't always succeeded in solving these problems. Of the 25 sustained release capsules we've tried to make, nine have failed to reach the market for one reason or another. So far, our R & D costs for sustained release preparations amount to over four million dollars. This figure does not include the very substantial costs incurred by our quality control program.

The case of the shattered pill illustrates again that immediate failure may lead to eventual success, and

(*Continued on page 552*)

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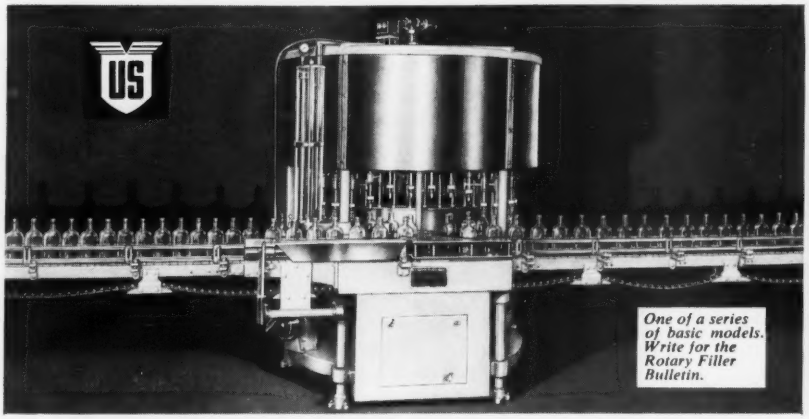

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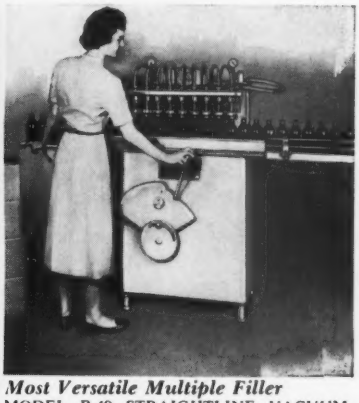

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(*Continued from page 550*)

that serious attempts to achieve small goals may result in the achievement of far larger ones.

I've told these case histories to illustrate some truths about pharmaceutical research: that scientists in industry and academic institutions are interdependent; that useful drugs have no favored birthplace—they can come from almost anywhere; that responsible members of the pharmaceutical industry are not merely engaged in manipulating molecules, but in trying to create drugs that are distinct advances in medicine; and that the paths to medical breakthroughs are sometimes long, devious, and unpredictable.

I hope I've dispelled the all-too-common notion that the sole real achievement in research is that made only by the inspired chemist whose mind is visited by a brilliant, unique idea. In pharmaceutical research, the final goal is a usable medication that is an effective weapon against disease in individuals. It's absured to think that pharmaceutical research ends at the beginning, with the initial synthesis of an active compound.

To those of us associated with pharmaceutical research, some of the statements we read in the lay press are incredible; for example, a recent article in *Life*, which quotes a teacher of pharmacology as dismissing the importance of the industry's research by calling most of it "me-too research," and by implying that its achievements have been very few indeed. This opinion overlooks the pharmaceutical industry's contributions in the discovery and development of Vitamin B_1, B_6, B_{12}; sulfa drugs; cortisone; broad-spectrum antibiotics; antidiabetic sulfonamides; diuretics; antihypertensives; and antipsychotics—and this is by no means a complete list.

Pharmaceutical research has contributed greatly to public health. Appearing last year before a Senate Appropriations Committee, Dr. William Middleton, VA Medical Director, reported that, thanks to new chemical agents developed by private industry, the VA hospital population of patients with tuberculosis dropped from 15,960 to 10,250 in the four years from 1954 to 1958. This drop represented a saving of 107 million dollars. His testimony also revealed that the VA now discharges about 41,000 mental patients a year in contrast to the 28,000 a year it was discharging before the tranquilizing drugs were developed.

I'm merely trying to make the point that the pharmaceutical industry deserves a bit more credit than some of our critics seem willing to give. The drama of medical progress is enacted by a large ensemble of players. All players alternate between leading and supporting roles and, as in all dramas, success is not achieved without the cooperation of each. For medical research to be fully productive, physicians, pharmacists, indeed, scientists of all kinds, must work closely together.

Pharmaceutical research can be proud of its contri-

butions to medicine. I think most would share the view voiced by Nobel prize winner, Dr. Philip S. Hench, who recently said:

"I think I can speak for a large segment of the medical men and for investigators who are most anxious that the processes, and financial soundness, the policies of these companies that have done such a magnificent job in the last few years, should not be impaired."

Its job could not be done, its accomplishments could never be achieved without the industry's willingness to spend enormous amounts of money on research whose outcome is problematical. Take the multimillion dollar research gambles Lederle has undertaken in recent years: 7 million dollars in trying to develop a live polio vaccine; 5½ million in trying to develop chemical agents to fight cancer—none of it, by the way, government money. Who can say whether these projects, particularly the last, will be successful? I happen to think that eventually they will be, just as will other large research projects being carried out by other firms. But success may be a long way off.

Eventual success, if it does occur, has been and will be preceded by a multitude of immediate failures, for we not only acquire know-how from failures, but also gain insight into even greater therapeutic goals.

ITCHING: NATURE AND CAUSES

(*Continued from page 471*)

lease of enzyme through continued activation, or an inadequate inhibitor mechanism. At any event, itching, with or without dermatitis, leads to scratching, superimposed dermatitis, and infection. Scratching presumably releases epidermal cathepsins. Superimposed dermatitis may be associated with increased fibrinolytic activity, and secondary infection results in the liberation of bacterial kinases.

There are two major sources of proteinases in the skin. One is the epidermal cell itself, which contains the proteinase group of cathepsins. There are also the intracellular endopeptidases, which have activities identical with those shown to produce pruritus experimentally. Thus, clinical itching may well arise from the activation and release of proteases in the region of the superficial epidermal network of receptors responsible for itching. Pruritus, therefore, signifies skin damage arising not primarily from physical stimulation but rather from stimuli of chemical origin.[8]

Allergic disorders can be associated with a rapid activation and release of proteinases. There may be a common pattern of proteinase action for the many clinical pruritic states. In bacterial and fungal infections of the epidermis associated with pruritis, proteinases are released from the microorganisms. Mechanical or electric stimuli that produce minor epi-

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dermal cellular damage may release or activate proteinases to produce an itch.[8]

More recent work[9] fails to show a parallelism between the proteolytic and pruritogenic activity of enzymes. Scratch testing of the proteolytic enzymes, ficin, papain, pancreatin, trypsin, and chymotrypsin produce pruritis diminishing in the order given, in concentrations of 1:10 up to 1:100. However, the pruritogenic character of the enzymes is not lost when the proteolytic activity is destroyed by heat.

Another aspect of chemical production of itch is the possibility of central itch. The production of itch by the action of chemical agents on the central nervous system has not been clearly demonstrated in man. However, experiments on cats and dogs have shown that the application of certain drugs to the brain provokes marked scratching.[10] This experimental work in animals raises the possibility that certain types of itching in man might be of central origin, particularly in those instances where itching is widespread and where there are initially no abnormal manifestations in the skin. The relief of itching by antihistamine drugs is, of course, no proof that the cause of itching is histamine release, since these drugs have well-recognized central nervous depressant actions.

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THIOGLYCOLATE

(Continued from page 480)

himself well in his cooperative efforts with the cosmetic chemist.

Attacks on the thioglycolates, one of which appeared in the *Journal of the American Medical Association*, and another in a national woman's magazine, appearing during the summer of 1946, bringing the cold wave industry to an abrupt halt, momentarily. These attacks made serious charges against the thioglycolates, blaming them for undesirable systemic effects, with the consequence that efforts were made to have their use as a cosmetic material banned. With the very existence of these promising materials threatened, a group known as The Professional Cold Wave Manufacturers Association was organized and chartered. The membership consisted of beauty product manufacturers and thioglycolate manufacturers. They marshalled the resources of the cold wave industry and engaged as their consultant, Kettering Laboratories, to determine whether these charges were true or not. In addition, independent thioglycolate and beauty products manufacturers engaged

toxicological and biological laboratories to conduct more detailed investigations (per Cappell & Cappell, Drug and Cosmetic Industry, August 1956), and the Food and Drug Administration set up a study under Dr. Draize. All these bodies concluded, after extensive testing, that the thioglycolates as used in cold permanent waving were safe, and that there was no evidence of injury to tissues or organs. Thus exonerated from possible harmful effects from its continued use, cold permanent waving surged forth with new vigor. As a result of the findings of the various testing and research groups, specifications were tightened up and new definitions of the established product were adopted.

The Cosmetic Manufacturer

Many new companies came into existence and grew in prominence as a result of thioglycolates in cold permanent waving. In the 1940's, some of the proud old houses that had for years manufactured beauty preparations and equipment for salons started a downward swing. They were not persuaded that cold permanent waving was here to stay or that there was any virtue in the product. A whole new group of manufacturers achieved prominence and prosperity at this time, as the leaders who adopted thioglycolates and who came to recognize the importance of the chemist in the scheme of things. They established research laboratories and beauty clinics, and learned that research was a prerequisite to preeminence in the competitive world, paying off very well. Costly marketing mistakes were avoided as much as possible by using testing techniques that were constantly improved. Instinct, intuition, and sometimes guess work, which had played its part in the growth of the beauty industry, were gradually eliminated as a basis for establishing superior products.

With the advent of the home permanent wave as a cosmetic preparation, the field of cosmetic research and development, as well as merchandising, entered a broader field of development. Necessarily, the separate and distinct manufacturer of over-the-counter products had to borrow much detailed information and knowledge of the product from the manufacturer of beauty preparations for professional use. The cosmetic companies very early set the pattern of elevating cosmetic chemistry to its proper role of developing and testing a product from basic laboratory glassware mixing to the pilot stage, and then on to the plant, in order to achieve a well-balanced and well-perfumed cold wave solution.

Originally, manufacturers of home permanent waves marketed sulfite preparations in paper packages; these were distributed in variety stores as well as drug and department stores. At that time, it was noted that sulfite "permanent" waves lasted approximately three to five weeks.

In 1944 when, on the recommendation of a thioglycolate manufacturer, ammonium thioglycolate

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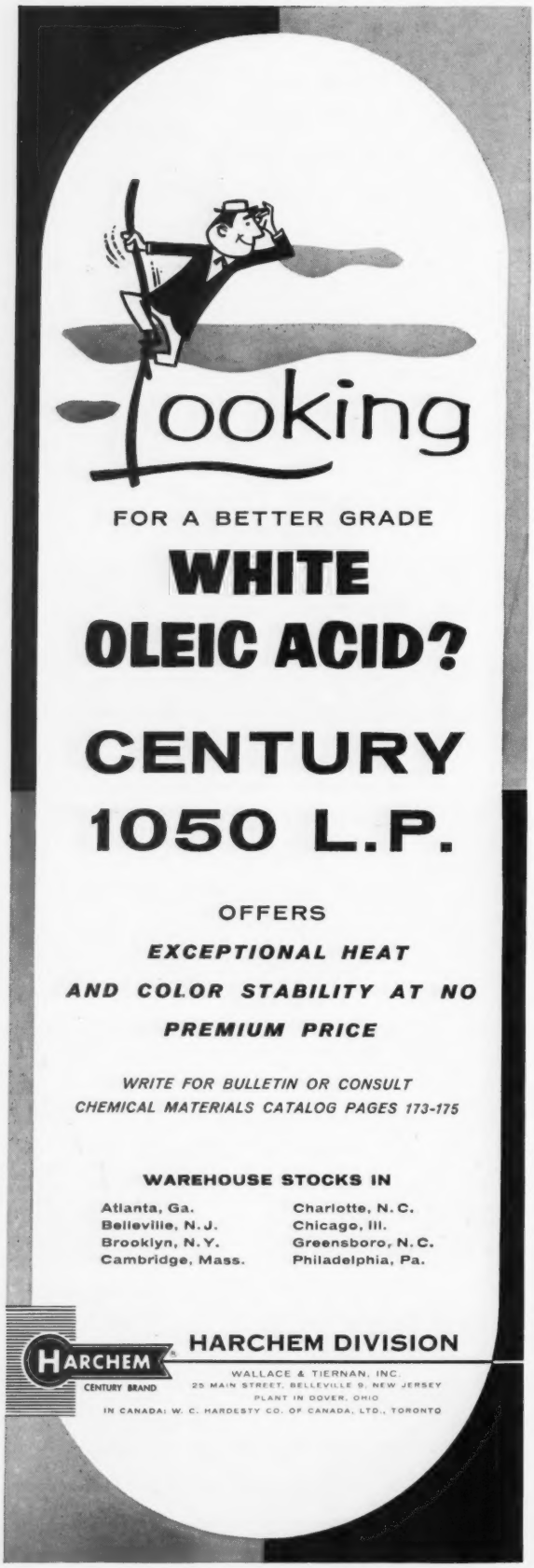

was introduced as a home permanent wave for the first time, it quickly gained great popularity. Shortly, other kits appeared, some having monoethanolamine or sodium thioglycolate instead of the ammonium salts. Within an amazingly short time, there were large numbers of manufacturers of home permanent-wave kits, until one enterprising manufacturer caused a revolution in advertising methods by starting radio and later television promotion. Some smaller manufacturers of home permanent-wave kits soon fell by the wayside; there may have been one or two, even, that refused to enlarge their advertising budgets and eventually were forced to give way to what came to be known as "the giants."

The Cosmetic Chemist

The use of a chemical which could act as a primary irritant under certain specific conditions left no room for guess work, for an unsatisfactory product will be forced off the market immediately. Trained minds only, could be relied on to develop and later test formulations for safety, thus avoiding the pitfalls of poorly planned and hastily checked products. The chemist is the one relied upon to advise what steps should be taken in the event of product problems, and this helps to gain recognition for him as an integral part of a successful organization.

The role of the cosmetic chemists has continued to grow in prominence as larger research budgets are adopted and deeper study of the hair structure is undertaken. Actually, today, the hair chemist is more or less a specialist in his field as a result, first, of home permanent waving and, later on, the more careful development of shampoos and hair dyes.

The position of the cosmetic chemist today has become blessed with better salaries and recognition of office as a result of the prominence played by the scientific preparations and knowledge needed in cold permanent waving. There is more truly scientific work done on hair products today in three months than there was in the ten years prior to 1941.

The highly competitive and lucrative cold wave field and the technical nature of development and controls required on its products, necessitated a greater dependence on trained chemists for reliable operation. The stakes for profits were high, too; consequently, there was greater incentive to spend sums of money on what came to be looked upon as an essential service. The larger companies were generally the first to recognize this need. From them, it spread to small concerns that had to maintain their competitive position.

The responsibility of the cosmetic chemist to his industry and company will continue to grow in quality and scope as present and future products challenge him to greater efforts and results. He does not take lightly the role that he plays in one of the country's largest industries, which is rapidly approaching the billion dollar mark. •

(*Continued from page 475*)

being acetic acid, butyric acid, carbon dioxide, and hydrogen.

Bacteria in Agriculture

The tanning of leather requires carefully controlled bacterial decomposition, usually from cultures of *Proteus vulgaris*, or a weak fermenting infusion of bird or dog dung, or other animal excreta.

In curing tobacco, the process is also one of fermentation, but the exact nature and mechanism of the changes are not clearly understood. The *Bacillus subtillis*, *Bacillus mycoides*, and some species of *Proteus* may be involved, along with certain plant enzymes.

The production of silage is a simple method for the preservation of foods for stock animals. Any farm product can be siloed if it contains sufficient carbohydrate and flat sour bacteria for the production of the acid needed for its preservation. The silage juice contains billions of microorganisms, mostly *Lactobacillus bulgaricus*, *Lactobacillus acidophilus*, and certain *Streptococci*, together with the acids and alcohols produced by the bacterial decomposition of the sugars. Complete loss of silage may result when putrefactive changes and acid accumulations occur in heavily soiled silage.

The Alcohol Industry

Ethyl alcohol is prepared commercially by the action of microorganisms, chiefly yeasts, on various carbohydrates—crude molasses, potatoes, sugar beets, hydrolyzable starches, and cellulose. Certain aerobic bacteria, *Bacillus acetoethylicus* and *Bacillus macerans*, are also used to produce alcohol as well as acetone from carbohydrates. Acetone and butyl alcohol can be obtained by the action of organisms, especially anaerobes like *Clostridium acetobutylicum*, grown on starch or corn meal mash.

Alcoholic-beverage production in the beer and wine industries utilize sugar fermentation by saccharomycetes (yeasts) to form alcohol and carbon dioxide. Specially selected strains of bacteria are inoculated in pure cultures to control the taste, odor, and flavor of the various wines.

Industrial Microbiology

In vitamin assays, analysts take advantage of the selective nutritive requirements of microorganisms. Procedures have been devised to determine the vitamins present in food or other substances. *Lactobacillus casei* is used for the determination of riboflavin (B_2 or G), pyridoxine (B_6), and pantothenic acid; *Lactobacillus arabinosus* for niacin. *Saccharromyces cerevisiae*, a commercial yeast, is employed to determine the amount of thiamin (vitamin B_1), by measuring the rate of fermentation of glucose to carbon dioxide and alcohol.

Butane is a compound formed in the manufacture of synthetic rubber during the microbial fermenta-

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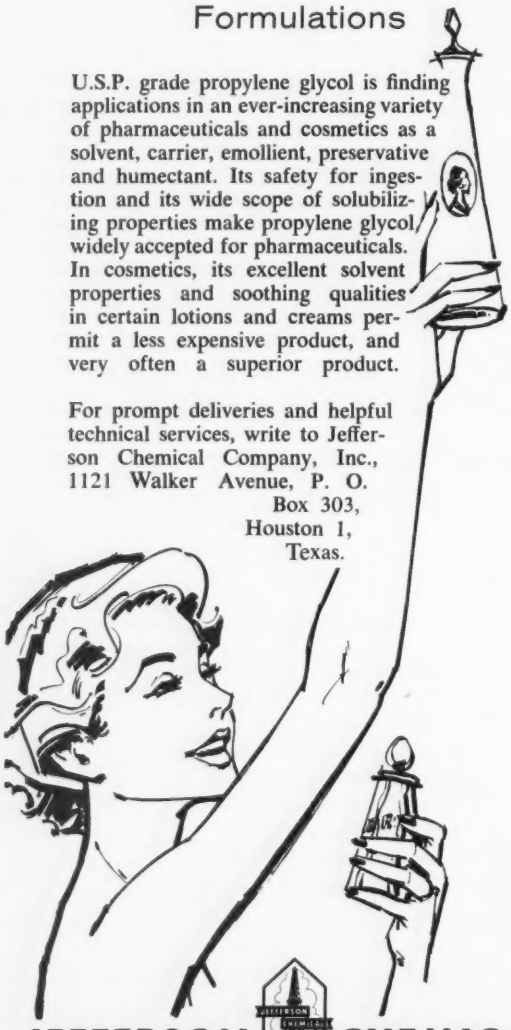

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154

tion of corn starch mash.

The petroleum industry utilizes certain bacteria, such as the *Pseudomonas* and *Achromobacter*—molds that may attack hydrocarbons, mineral oil, and other soil organism.

Bacteria also play a role in the pulp and paper industries, and affect the preserving qualities and behavior of rubber, latex, and wood.

Conclusions

It will thus be seen that the endless biochemical activities of bacteria present unlimited possibilities both in peace and war, either indispensably utilitarian or fearfully destructive to the civilized world. Research opportunities in the biochemistry and biophysics of bacterial activity are therefore virtually unlimited in scope and invaluable because of their relationship to so many phases of human progress.

BATH FRAGRANCE

(Continued from page 469)

Because perfume compounds vary so much in their properties, each formulation requires an individual approach. By way of general advice it can be pointed out that perfume oil at 1 per cent or more is not likely to be taken up properly by the finished emulsion. The chances are that it must be incorporated into the oil phase immediately before emulsification.

If difficulties persist, check the *p*H of the perfume oil; if it is extreme, ask the perfumer to do something about it. He can prepare a specally adapted version of the fragrance whose other forms are to be matched, that will combine optimum effect, compatibility, and economy. While close collaboration between perfumer and cosmetic chemist is always desirable, it is altogether indispensable for the successful development of a fragrant body lotion with genuine merit.

Men as well as women represent an excellent market potential for such a product. They, too, suffer from dry skin conditions, but have no cosmetic answer to it. There is no body lotion especially designed for men, as far as I myself know. The specifications should be identical with those for the women's product, except that the fragrance must be of a masculine character, and at a lower level of concentration.

Another standard item among bath preparations is dusting powder. Here, too, there is some conflict between fragrance and function, but of a different nature. The functional aspect is neglected in the packaging. The so-called prestige perfume houses usually have a large box of dusting powder in their lines. This makes an impressive gift item at a moderate price, but is not the ideal package for modern living. There might well be more of the smaller, light, shaker containers, well-designed to fit a bathroom cabinet and to carry while traveling, which are filled

with the kind of product now primarily found in the large boxes. Modern aluminum, polyethylene, and polypropylene containers can serve. Some years ago, a dusting powder in a squeeze bottle was strongly promoted and enjoyed popularity. The plastic squeeze bottle still seems to be a highly suitable package for body powders, especially since improved techniques permit more attractive decorating and general appearance than could be obtained when the first squeeze bottles became available. Naturally, when plastics are considered, it is necessary to test for odor permeation.

The latest development in dusting powders, only about two years old, is the aerosol spray can. Many users like its convenience and appreciate the cooling effect which is incidental to the application. With the original formulation, there was an excessive chilling effect objectionable to many users. Aerosol packers, in the meantime, have learned to modify this so that modern formulations provide a pleasant cooling sensation rather than a frigid shock.

With all these body powders, fragrance should be the prominent feature, lending distinction to the item, and justifying prices above those of talcum powders sold in supermarkets.

It will be obvious to the reader that the idea presented here is that better integration of cosmetic features with quality odors is desirable in general, besides being helpful to merchandising, promotion, and sales in particular. The whole burden of the argument can be summarized as calling for functional bath and body care preparations that will furnish a fragrance foundation to support a regularly used toilet water and perfume.

The recent past has been a period of vastly increased application of fragrance materials in many fields where none had been used before. Perfuming and odor masking have grown in quantity. With so many products of all kinds surrounding us continuously with a medley of odors, it will be necessary to upgrade the perfume quality of any item for personal use, if it is to make an appreciable olfactory impression and to stand out prominently against the multitude of competitors.

COLD-WAVE AEROSOL

(*Continued from page 485*)

teriors are epon-coated, as is the aluminum valve cup, and the exteriors are lithographed in three colors over a base coat.

The new product cuts about 20 minutes from the usual 90-minute waving time, since a special Precision valve and attached nozzle eject the product in a steady stream, rather than spray. It is, therefore, less tiring to use. The wave comes in three strengths, for normal hair, dyed or bleached hair, and for hair difficult to wave. Concentration of chemical additives

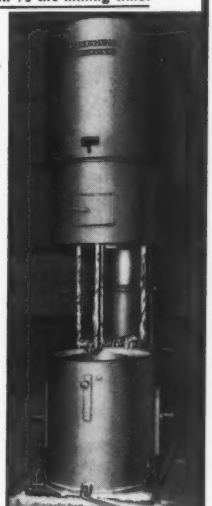
(*Continued on page 562*)

FOR PROPELLANT___ OR PLASTISOL*

ROSS DOUBLE PLANETARY

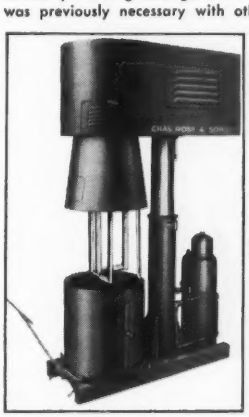
Change Can Mixers give better mixing in less time!

At *Thiokol*® solid propellant plant in Elkton, Md., this Ross #130CDM variable speed 100 gallon Mixer produces the **same high quality mix as obtained in Horizontal Double Arm Kneaders, and in ⅓ the mixing time.**



With no bearings or stuffing boxes in the product zone, stationary can, completely enclosed mix, and remotely controlled raising and lowering device, the Mixers are as safe in operation as they are efficient. Mixers have low original and maintenance cost, are easy to clean, and extremely versatile in operation.

Lower illustration shows an 85 gallon #130-CDM Double Planetary Change Can Mixer furnished a leading concern for mixing plastisols of several types ranging up to 200,000 centipoises. Customer reports Mixer in operation 24 hours/day with mixing time per batch only 15-20 minutes; while the quality of mix and dispersion is so high that the final product is obtained in the Mixer alone — without further processing through a Three Roll Mill as was previously necessary with other Mixers.



Jacketed cans for heating or cooling material during mixing, dolly trucks, gates on cans for discharge, and vacuum tight covers can be provided.

*---or any other heavy paste material. On paints, inks, pharmaceutical products, caulking compounds, and other similar materials, the Ross Double Planetary Change Can Mixers mix and disperse up to 30 times faster than other Mixers.

Mixers available in 1, 2, 3, 4, 6, 8, 12, 20, 25, 65, 85, 125 and 150 gallon sizes. *Write* for complete information on these or other types of Ross mixing, grinding or dispersing equipment!

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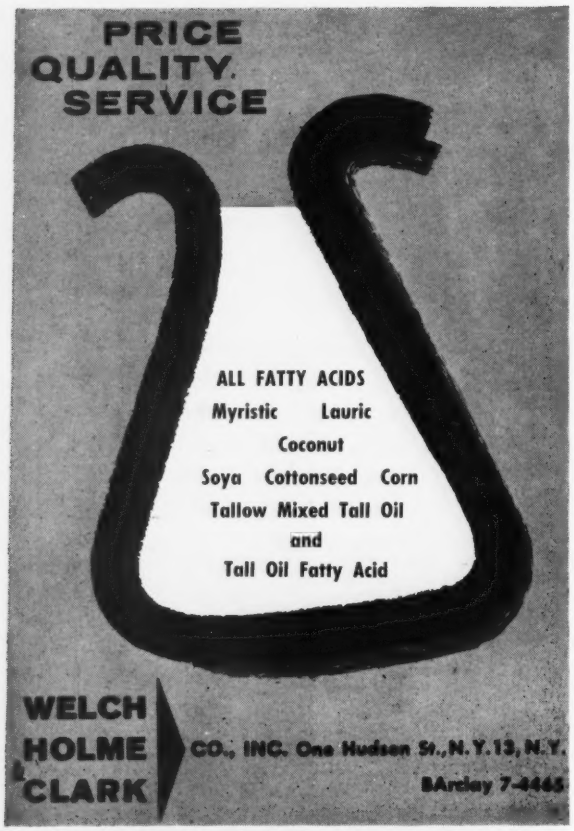

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COMING EVENTS . . . . .

APRIL

17-19 **Animal Health Institute,** annual meeting, Shoreham Hotel, Washington, D. C.

18-20 **Gas Chromatography Symposium,** Canisius College, Buffalo, N. Y. (Dr. Herman A. Szymanski, Canisius College, 2001 Main St., Buffalo 8, N. Y.)

19-21 **Research and Development Associates, Food and Container Institute,** annual meeting, Congress Hotel, Chicago, Ill.

20 **Society of Plastics Engineers,** north Texas section, annual regional technical conference, Hotel Texas, Fort Worth, Texas

20 **Society of Cosmetic Chemists,** New York Chapter, monthly meeting—ladies' night, Hotel New Yorker, N. Y. C. (Dr. Saul Bell, S.C.C., 2 East 63rd St., N. Y. C.)

25-26 **Society of the Plastics Industry,** Canadian section, London Hotel, London, Ontario, Canada. (S.P.I., 250 Park Ave., N. Y. C. 17)

28 **American Society of Perfumers,** annual open symposium, Essex House, N. Y. C. (Dorothy A. Douglass, A.S.P., 630 Fifth Ave., N. Y. C. 20)

28-30 **American Assn. of Pathologists and Bacteriologists,** Hotel Peabody, Memphis, Tenn. (Dr. Russell L. Holman, Dept. of Pathology, L.S.U. School of Medicine, New Orleans, La.)

29 **Parenteral Drug Assn.,** scientific meeting, Warwick Hotel, Philadelphia, Penna. (P.D.A., 1420 Snyder Ave., Philadelphia 45, Penna.)

MAY

2-11 **Pan American Medical Assn.,** Section on Pharmacology and New Drugs, congress, Mexico

4-7 **Flavoring Extract Manufacturers Assn.,** annual convention, Hershey Hotel, Hershey, Penna.

7-13 **Society of the Plastics Industry,** national conference and annual meeting, cruise on the "Queen of Bermuda." (S.P.I., 250 Park Ave., N. Y. C. 17)

8-11 **Proprietary Association,** annual meeting, The Greenbrier, White Sulphur Springs, W. Va. (Dr. Howard A. Prentice, 810 18th St., N.W., Washington 6, D.C.

9-13 **Instrument Society of America,** instrument-automation conference and exhibit for San Francisco, Brooks Hall, San Francisco, Calif.

9-14 **International Symposium on Fermentation,** Italian Institute of Public Health, Italian Chemical Society, and Fermentation Division of the Agricultural and Food Chemistry of the A.C.S., Rome, Italy

11 **Toilet Goods Assn.,** Scientific Section, Waldorf-Astoria Hotel, N.Y.C. (Kathryn Fitzpatrick, Americas Bldg., Rockefeller Center, N.Y.C. 20)

11-13 **Synthetic Organic Chemical Manufacturers Assn.,** annual spring outing, Shawnee-on-Delaware, Penna. (S. Stewart Graff, S.O.C.M.A., 41 East 41st St., N. Y. C. 17)

11-13 **American Material Handling Society,** in conjunction with annual western handling show and packaging cavalcade, Great Western Exhibit Center, Los Angeles, Calif.

11-13 **Synthetic Organic Chemical Manufacturers Assn.,** spring outing, Shawnee Inn, Shawnee-on-Delaware, Penna.

12 **Pharmaceutical Advertising Club,** promotion clinic, Hotel Roosevelt. (D. Lindsay, P.A.C., Suite 608, 489 Fifth Ave., N. Y. C.)

12 **Society of Cosmetic Chemists,** spring meeting, Hotel Biltmore, N. Y. C. (S.C.C. 2 E. 63rd Street, N. Y. C. 21)

15-18 **Proprietary Assn.,** annual meeting, The Greenbrier, White Sulphur Springs, West Va. (Dr. Howard A. Prentice, 810 18th Street, N.W., Washington 6, D. C.)

16-17 **Chemical Market Research Assn.,** annual meeting, Hotel Baltimore, N. Y. C.

16-18 **Chemical Specialties Manufacturers Assn.,** mid-year meeting, Drake Hotel, Chicago, Ill. (C.S.M.A., 50 E. 41st St., N.Y.C 17)

18 **American Society of Perfumers,** open meeting, Advertising Club, N. Y. C. (Dorothy A. Douglass, A.S.P., 630 Fifth Ave., N. Y. C. 20)

19 **Cosmetic Industry Buyers & Suppliers Assn.,** special ladies' day luncheon meeting, N. Y. C. (Frank N. Pond, Dominion Products, Inc., 10-40 44th Drive, Long Island City 1, N. Y.)

19-20 **Pharmaceutical Manufacturers Assn.,** Production and Engineering Section, The Broadmoor, Colorado Springs, Colo. (Dr. Carl Bambach, P.M.A., 1411 K Street, Washington 5, D. C.)

JUNE

1-3 **Instrument Society of America,** annual instrumental methods of analysis symposium, Montreal, Quebec.

6-8 **American Material Handling Society,** New England show, Commonwealth Armory, Boston, Mass.

8-10 **Society for Analytical Chemistry and Gas Chromatography,** symposium on gas chromatography, Assembly Rooms, Edinburgh, Scotland

9-11 **Manufacturing Chemists Assn.,** annual meeting, Greenbrier Hotel, White Sulphur Springs, West Va.

9-12 **American Therapeutic Society,** Barcelona Hotel, Miami Beach, Fla.

11-12 **American Diabetes Assn.,** Hotel Deanville, Miami Beach, Fla.

12-15 **Extension Services in Pharmacy,** annual national industrial pharmaceutical research conference (stabilization and stability testing of pharmaceuticals), King's Gateway. Land O' Lakes, Wisc. (Richard S. Strommen, E.S.P., Univ. of Wisconsin, Madison, Wisc.)

12-17 **Pharmaceutical Society of the State of New York,** annual convention, Saranac Inn, Upper Saranac Lake, N. Y.

13-15 **Chemical Institute of Canada,** annual conference and exhibition, Ottawa, Canada

13-15 **1960 Microscopy Symposium,** Del Prado Hotel, Chicago, Ill. (Walter C. McCrone Associates, sponsors)

13-17 **Gordon Research Conferences,** lipide metabolism, Kimball Union Academy, Meriden, N. H.

13-17 **American Medical Assn.,** annual meeting, Miami Beach, Fla.

13-17 **Pharmaceutical Advertising Club,** annual P.A.C.-M.P.A.C. joint meeting.

16-17 **National Colloid Symposium,** A.C.S. Division of Colloid Chemistry, University Center, Lehigh University, Bethlehem, Penna.

19-22 **American Institute of Chemical Engineers,** Del Prado Hotel, Mexico City, Mexico

20-24 **Gordon Research Conferences,** cell structure and metabolism-secretion, Kimball Union Academy, Meriden, N. H.

24 **Parenteral Drug Assn.,** scientific meeting, Edgewater Beach Hotel, Chicago, Ill. (P.D.A., 1420 Snyder Ave., Phila. 45, Penna.) *(Continued on page 563)*

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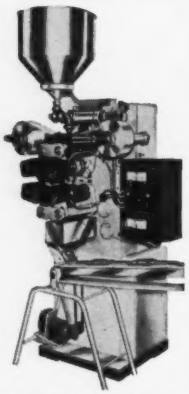

Designed and built to the highest standards of Swedish craftsmanship, the new Kisab line is giving real meaning to the oft used phrase "High Speed".

For instance, the KIPAK, shown at right, used for liquids, powders and granular substances,will fill and seal 2500-5000 packages per hour; cellulose film, aluminum foil, cellophane, acetate, Saran, Pliofilm, etc. Sizes from 1 3/16" x 1 1/16" to 5 5/16" x 17 5/16".

Other fine Kisab machines are designed to handle powders and grainy products in portion packages at from 5,000-14,000 per hour; package tablets and similar objects in strips at speeds up to 18,000 per hour; or package such things as tooth brushes, sawblades or lollipops at up to 3,900 per hour.

Parts and service are never a problem as we maintain an expertly staffed, fully equipped service plant right here in the U.S. Write today for all the facts.

ARENCO MACHINE COMPANY, INC.
25 West 43rd Street • New York 36, N. Y.

(Continued from page 559)

is designed for a fast professional permanent; for home use, it would have to be lowered.

Small aluminum aerosols, while more expensive than those made of other metals, are finding many new uses, especially for products of high quality that are packaged to be carried.

The attractiveness and light weight of the container is particularly suited to products for women, and new valve developments eliminate waste by making it possible to measure out as many as 500 applications of certain products from a one-ounce container. This evenness of application is important in the drug and pharmaceutical field for such products as eye and nose sprays, and burn and surgical sprays.

The combination of aluminum and aerosol is proving especially valuable for prospective packagers of specialty products.

WHIRLING-ROTOR GRANULATION

(Continued from page 479)

then on to the tablet compressing department.

The automatic drying-and-granulating system runs continuously.

In addition to the two Stokes mills permanently mounted in the automated granulating-and-drying system for Gelusil, Warner-Chilcott has two additional mobile units, which are mounted on casters and can be rolled from department to department.

Special tribute may be paid to the rugged durability of the Stokes mills. The abrasive nature of the magnesium trisilicate and aluminum hydroxide mixture, plus the mechanical rubbing action that took place, used to wear out the screens of the earlier granulating equipment about once a month. This meant costly screen-replacement as well as time lost for repairs. The Tornado Mill, which has no mechanical rubbing action but whirls the material against the screen at terrific speed by the centrifugal force of its vertical rotor, has not worn out a single screen in the ten months it has been in operation.

Not only its ruggedness but its greater production capacity recommend the Stokes Tornado Mill to pharmaceutical manufacturers. This higher capacity, which enables a unit with a seven and one-half horsepower motor to do the same work as any other mill with a 15 horse-power motor, is due to the unit's large screen area, a full 360 degrees surrounding the vertical rotor. This design also contributes to the excellent uniformity of the product.

All parts of the mill that come in contact with the Gelusil are fabricated of stainless steel to provide resistance to corrosion and to prevent contamination. ●

(Continued from page 561)

JUNE

27-30 **Toilet Goods Assn.**, annual convention, Poland Springs House, Poland Springs, Maine. (Kathryn Fitzpatrick, Americas Bldg., Rockefeller Center, N. Y. C. 20)

27 **Gordon Research Conferences**, proteins and nucleic acids (through July 1), New Hampshire School, New Hampton, N. H.

28 **Oil Trades Assn. of New York**, golf outing, Siwanoy Country Club, Bronxville, N. Y.

JULY

3-9 **American Assn. Colleges of Pharmacy**, annual convention, College of Pharmacy, University of Colorado, Boulder, Colo.

4-9 **Society of Chemical Industry**, annual general meeting, Bristol, England

11-15 **Gordon Research Conferences**, chemistry, physiology, and structure of bones and teeth, Kimball Union Academy, Meriden, N. H.

19-21 **Western Packaging & Materials Handling Exposition**, Pan Pacific Auditorium, Los Angeles, Calif. (Western Packaging Exposition, Clapp & Poliak, Inc., 341 Madison Ave., N. Y. C. 17)

AUGUST

1-5 **Gordon Research Conferences**, instrumentation, Colby Junior College, New London, N. H.

1-5 **Gordon Research Conferences**, steroids and other natural products, New Hampton School, New Hampton, N. H.

8-12 **Gordon Research Conferences**, food and nutrition, Colby Junior College, New London, N. H.

14-19 **International Congress of Clinical Chemistry**, Edinburgh, Scotland

DRUG PROFITS

(Continued from page 477)

tion in our industry is not only vigorous but that it will take care of the nation's primary requirement from us—a high discovery rate of products for better and better health.

Let us, however, keep this fact in mind: A high rate of change and obsolescence is costly. Many of our citizens are balking right now at the price we would be forced to pay to catch up with the Soviet Union's rate of discovery in the race for space. And the reason why the Soviet Union has allowed itself to be blanked out completely in the international competition for new drugs is because it did not want to foot the bill. The United States has now drawn so far ahead in pharmaceutical research that it will take the Soviets more than ten years and more than a billion dollars to close the gap.

Am I, then, saying that because of the high cost of change and obsolescence this industry is necessarily characterized by a rapid rise in the level of prices? I am not. We have already done a better job than almost any other industry in holding the price level steady, despite inflation. As the economist, Dr. Jules Backman, has put it so succinctly: "If drug

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prices had risen as much as other prices since 1939, it would cost the consumer at least another billion dollars to buy the drug preparations now consumed."

In view of this record of holding the line against inflation, why do we hear so much these days about the high price of drugs? There is probably no single answer to this question. But certainly one of the reasons for this complaint is that people are spending more for health care and drugs than ever before, and they erroneously assume this is entirely due to higher prices.

The facts show the reverse to be true. The Health Information Foundation recently released the results of a nationwide study of consumer expenditures in the health field. The study, conducted by the National Opinion Research Center of the University of Chicago, compared per capita health expenditures in 1957-58 with those of five years before. The results showed that per capita expenditures for drugs had risen 83 per cent in those five years, but it also showed that increased use of drugs amounted to 73.5 per cent per capita.

This means only one thing. It means that the American people are spending more and more for drugs because they find that these drugs are more and more useful. I wonder if there is a single other industry that can show a record of comparable growth based on matching the needs of the public through the products of research.

I am proud of the fact that to date our industry has done such a good job of holding the level of prices, despite inflation. Our next job will be to see if we can find a way to reduce that level.

I predict we will continue to be successful. I predict we will be so successful, in fact, that no other industry in the country will be able to match our record during the next ten years on two counts: first, the development rate of new and useful products, and second, savings to the consumer.

I predict that we can do this and at the same time earn a reasonable profit. We shall accomplish this feat by widening our markets both here and abroad, as we lower our margins per dollar of sales.

I think our young, vigorous industry has built a solid foundation for the next decade both at home and abroad. We have harnessed the capitalist system to the needs of the nation's health. We have built an enduring and cooperative partnership between the quest for scientific knowledge on the one hand and the drive for financial success on the other. We have won the confidence of the American people both for our products and for the promise of our research. We have outdistanced our rivals in every country in the free world and left the Soviet Union way behind in the dust.

I look forward to the next ten years. By 1970 I believe we shall have made great inroads against the two big killers of mankind, cancer and heart disease. By 1970 I believe we shall have lifted a large share

of the burden of chronic disease from the backs of the aged and some of the anguish of mental illness from the daily lives of millions of our families. I hope, too, that we shall have been able to help the peoples of the underdeveloped countries in their war against poverty and Communism. It is a war they can never win without the weapons of modern medicine.

To do all these things, we shall need the kind of understanding public climate that will support us as we tackle the jobs that lie ahead. It may take words to win the understanding. But it will take deeds to win the support.

WHAT PRICE BEAUTY?

(*Continued from page 473*)

TABLE 2

Cosmetic Expenditures[2] (Dermatological Only) in 1958*

Dandruff products	5.790
Medicated shampoos	20.350
Hair Medicaments	8.220
Acne remedies	19.090
Medicated soap	5.970
Hair color rinses	9.860
Hair color tints, dyes	27.440
Men's hair tonics	66.520
Women's hair dressing	20.060
Lubricating creams	16.980
Deodorant soaps	66.680
Foundation creams	29.660
Hand creams and lotions	45.510
Makeup bases	29.660
Face powder, pressed	30.630
Face powder, loose	25.030
Liquid facial cleanser	26.610
Lipstick	82.360
Rouge	7.200
Deodorants	89.650
Color shampoos	4.010

*In millions of dollars.

ing, inescapable necessity for doing so. The tremendous number of corrective cosmetic products consumed, as exposed in Table 2, brings into focus the desperate efforts made by the American woman to achieve a maximum of social or sex appeal.

Dandruff products, medicated shampoos, and hair medicaments are sold for the treatment, prevention, or removal of dandruff. Collectively they add up to 34.36 million dollars, which at an average price of about 75 cents, would be equivalent to 45 million units or 45 million cases of dandruff, although repeat sales would lower this figure somewhat. This calculation does not encompass a vast number of persons who bear the tall-tale snow of dandruff, yet do not avail themselves of any treatment except perhaps brushing, and soap and water. From the above we may speculate that about 26 per cent of the total population suffers from seborrhea dermatitis of the scalp, which is a gross underestimation. A study conducted by a social research organization[3] unveiled the shocking prevalence of this malady as follows: urban incidence, New York and Chicago, 84 per cent; Hollywood and Boston, 80 per cent; Milwaukee

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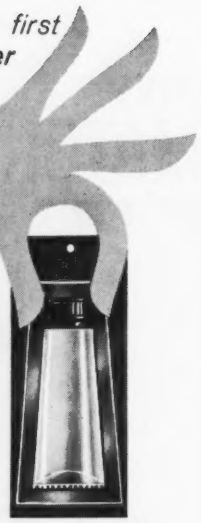

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and St. Louis, 77 per cent. The national norm for the United States, according to this survey, is about 70 per cent for city dwellers, with "stress" professions showing up to 95 per cent. The writer interrogated a limited number of barber shops and was thereby informed that about 90 per cent of their customers were affected by dandruff, to a greater or lesser degree. The ever-present flake of dandruff is a classic example of the public and the medical profession accepting the abnormal as normal. There is not a shadow of doubt that seborrhea of the scalp is a systemic disease with a direct bearing upon sebaceous metabolism.

Acne remedies, including medicated soaps, constitute a 25 million dollar segment of the cosmetic business. These preparations will average about 75 cents and, if we disregard repeat purchases, we may draw the inference that 33 million persons, mostly adolescents, were victims of and sought relief from acne. It is interesting to note that Table 1 and Table 2 both seem to indicate the incidence of acne at about 20 per cent.

Hair color rinses, tints, and color shampoos collectively produce 41.31 million dollars worth of business. These products are not expensive and we may therefore deduce that a great number of persons, many in their early twenties and thirties, were forced to resort to artificial hair coloring to conceal loss of hair pigment.

Men's hair tonics are responsible for formidable cosmetic volume—66.52 millions of dollars; these products are intended to maintain orderly hair, to improve appearance, and to add luster and life. They do accomplish their objectives, but the basic motivation for purchase is excessive dryness and lack of vitality or luster. In some cases they are applied in a "what can I lose" effort to retard falling hair. Women's hair dressings and conditioners are procured for the same reason as men's—to ameliorate dry, dull, drab inanimate hair—total dollar volume is 34.18 millions of dollars.

Hand lotions and hand creams comprise a considerable expenditure—45.51 million dollars. Many of these agents are utilized to offset the drying effects of soaps, detergents, and certain industrial operations. However, the major portion of these emollient products are called upon to relieve dryness and chapping of the hands occurring from internal causes.

Cleansing creams, lubricating creams, foundation creams, liquid facial cleansers, and miscellaneous creams are traded across the cosmetic counters of America in the magnitude of 138.13 million dollars. The desired function of the cleansing creams and liquid facial cleansers is the removal of excessive sebaceous secretion and the atmospheric flotation matter collected thereon, which in combination form an oily, greasy unattractive substance on the surface of the skin. At the same time, a necessary amount of lubricant is supposed to be restored. The creams

not intended for cleansing are designed and recommended to normalize dry skin, that is, skin deprived of normal sebaceous supply by the supplementation of some sort of lipid material such as lanolin. As is evident in Table 1, 38 per cent of the 1765 women interviewed admitted excessive dryness of the skin. Judging from the massive sales of skin emollients or lubricants, dry skin is probably the most common of all skin complaints, affecting at least 50 per cent of all females.

For makeup bases, pressed cake powder and loose face powder, the American woman exchanged 29.60, 30.63 and 25.03 million dollars, respectively. Face powder in any form is an efficient method of camouflage—so useful to hide enlarged pores, blemishes, pimples, excessive oiliness, and other unsightly dermatological aberrations. To engage in this concealment costs the female population a total of 85.26 million dollars annually, and implies the existence of an incredible amount of skin pathology. Face lotions and other facial astringents are patronized at the rate of 22.31 million dollars per year. Their single objective is to endow some semblance of tonicity to the skin and to reduce conspicuously enlarged pores. Slightly over 7 million dollars was expended for rouge to impart artificial color to skin, which should normally possess it. This subtle tinge is produced by epidermal pigment and by the circulation of blood through the sub-surface capillaries; its absence causes the skin to appear dull, pasty, and lifeless.

Deodorants are not visual cosmetics, but nevertheless are categorized as such. Annual sales are claimed to be about 89.65 million dollars, which can be translated into many millions of customers since their unit cost is low, averaging about 75 cents. These products have been assigned a dual role, the suppression of perspiration through the medium of astringency and the inhibition of fermentation of perspiration. Normal perspiration is not offensive, nor will it ferment, but dietary excesses or certain metabolic alterations will cause minute quantities of fermentable carbohydrates to be thrown off through the sweat glands, thereby providing a pabulum for air-borne bacteria. When bacteria metabolism made possible by the excretion of carbohydrates in perspiration takes place on the skin, fermentation occurs, liberating volatile compounds which have an unpleasant odor.

Effect and Cause of Dermatological Disorders

We have delineated in some detail the quantitative and qualitative characteristics of that portion of the cosmetic business directly related to deviations from integumental normality. The astounding sum of 629.72 million dollars was spent in 1958 in the United States for various products whose function was to conceal, mitigate, or correct the offensive signs and symptoms of pathology in a major body organ, the skin and its appendage, the hair. The fac-

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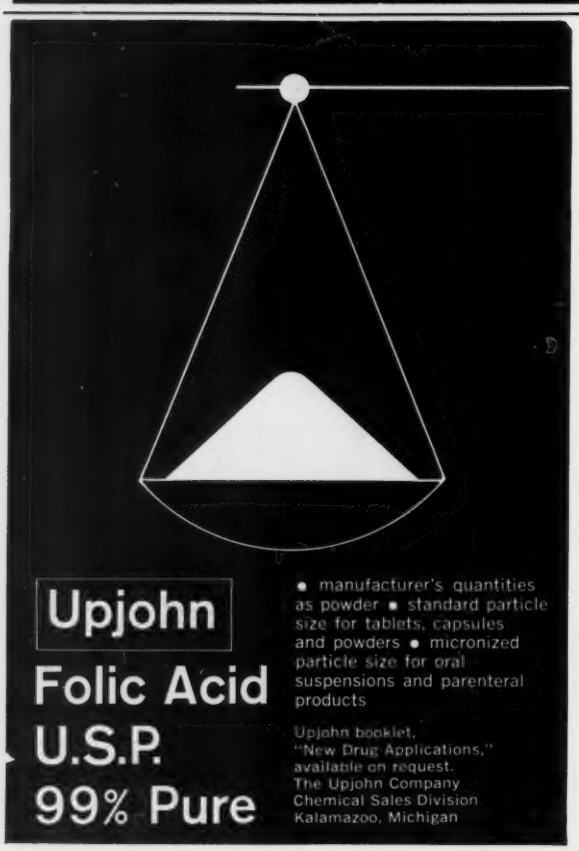
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tor or factors responsible for such wholesale, ubiquitous dermatological deterioration must necessarily be commensurately wholesale and ubiquitous. Efforts to indict climatic conditions, heating, air-conditioning, tempo of living, and possibly other environmental and behavior patterns, will, with relatively minor exceptions, prove futile. Certain occupational toxemias, local and general, may elicit dermatological repercussions, but these cases, when compared with the over-all picture, are insignificant. Hypokinetic disease or systemic degradation attributable to insufficient exercise is unquestionably of some consequence, inasmuch as any reduction in general physical fitness will sooner or later adversely affect the skin. Nevertheless, that great American failing, physical inanition, cannot be credited with more than a negligible etiological role in the skin problems set forth. To reiterate, the guilty factor or factors must exhibit a universiality of involvement comparable to the dimensions of the disturbances in question. Nutrition conforms precisely to this specification. Dietary errors and deficiencies have not only been etiological in a host of dermatological maladies, but have also spawned a vast and overwhelming catalog of systemic pathologies.

Proof of Guilt

The most common skin problems are excessive dryness, excessive oiliness, chapping, flaking, blackheads, enlarged pores, pimples, blemishes, aging, freckles, and lines. With the exception of freckles, lines, and aging, each of these signs and symptoms can be produced experimentally in the laboratory or clinic. Those conditions difficult to induce by nutritional manipulation, but which may be observed clinically or spontaneously, almost invariably can be corrected by the supplementation of those nutritional components thought or known to be etiological. We shall subsequently treat in some detail each recognized nutritional entity and its dermatological influence. Freckles are a facet of the pigmentogenic system and can be either congenital in origin or a reaction following repeated solar burns. So-called aging and lines can also be produced by excessive exposure to sunlight, although a somewhat similar degeneration can be evoked by the absence of certain nutritional factors. Specific relationships between cause and effect in dermatological dysfunction will be made apparent in the consideration of the individual essential nutrients. The behavior and necessity of a number of nutritional biochemicals still remains conjectural. We shall confine ourselves to those nutrients of firmly established essentiality.

(This is the first of two articles by Mr. Stambovsky.)

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